The Harman Kardon Model hk300xm

Stereo Cassette Deck

Technical Manual

harman/kardon

PRECAUTIONS

1. Always disconnect the chassis from power line when soldering. Turning the power switch OFF is not enough. Power line leakage passing through the heating element may destroy the transistors.
2. Never attempt to do any work on the transistor amplifiers without first disconnecting the AC line cord and waiting until the power supply filter capacitors have discharged.
3. Replacement for output and driver transistors, if necessary, must be made from the same beta group as the original type.
4. If one output transistor burns out (open or short) always remove all the output transistors in that channel and check the bias adjustment, the control and other parts in the network with an ohmmeter before inserting a new transistor. All transistors in one channel will be destroyed if the base biasing circuit is open on the emitter end.
5. When mounting a replacement power transistor, be sure that the bottom of the flange, the mica insulators and the surface of the heat sink are free of foreign matter, for they may cause transistor failure.
6. Silicon grease must be applied between the transistor and the mica insulator, and between the mica insulator and the heat sink for better heat conduction.
7. Fuses must be replaced with size and type indicated. Use of other types can expose components to destructive current levels.

ALIGNMENT PROCEDURES

General Conditions (unless otherwise noted)

1. Tape Select Switch is LN position.
2. Dolby NR Switch is OFF position.
3. Dolby HX Switch is OFF position.
4. MPX Filter Switch is OFF position.
5. Line Level Controls at maximum.
6. Output Level Control at maximum.
7. Bias Fine Trim Control at center.
8. Microphone Level Controls at minimum.
9. Connect 10 kΩ (1/4 W) carbon resistors across both left and right line output jacks.

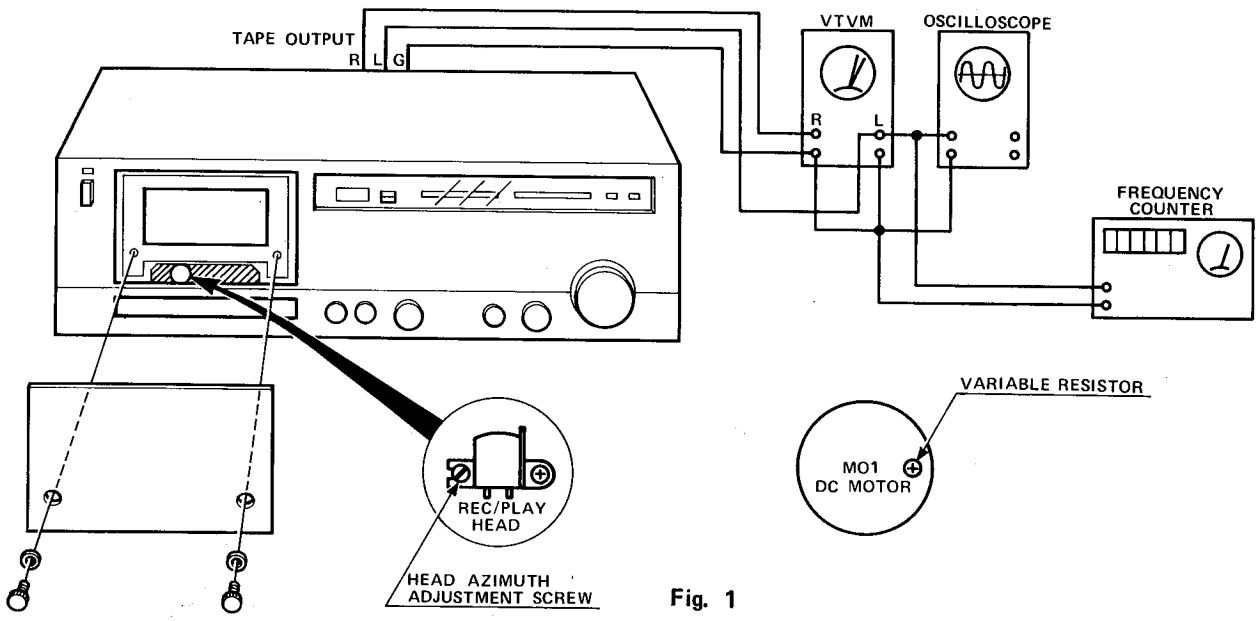


Fig. 1

Noise Reduction System and Headroom Extension System manufactured under license from Dolby Laboratories Licensing Corporation.
Dolby and the double-D symbol are trademarks of Dolby Laboratories Licensing Corporation.

ALIGNMENT PROCEDURES

HEAD AZIMUTH ADJUSTMENT

Equipment Required: Dual Channel AC V.T.V.M. and 10 kHz Test Tape (TEAC MTT-114)

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Play back the "A" side of the test tape and adjust Head Azimuth Adjustment Screw so that the output indicated by the V.T.V.M. will be maximum and the difference of output between left and right becomes less than 1 dB.
3. Play back the "B" side of the test tape and adjust Head Azimuth Adjustment Screw for maximum output.
4. Repeat steps 2 and 3, and adjust Head Azimuth Adjustment Screw until the difference of outputs from side "A" and side "B" becomes less than 1 dB.

TAPE SPEED ADJUSTMENT

Equipment Required: Frequency Counter and 3 kHz Test Tape (TEAC MTT-111D)

1. Connect frequency counter to TP3 (or TP2) and TP1 (ground).
2. Play back the test tape and adjust the variable resistor built in the DC motor for 3 kHz ±1%.

PLAYBACK AMP LEVEL ADJUSTMENT

Equipment Required: Dual Channel AC V.T.V.M. and Test Tape (TEAC MTT-150)

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Play back the test tape and adjust VR103 (left) and VR104 (right) so that the output will be 580 mV ±0.5 dB.

PLAYBACK EQUALIZER FREQUENCY CHARACTERISTIC ADJUSTMENT

Equipment Required: Dual Channel AC V.T.V.M. and Test Tape (TEAC MTT-316)

1. Set tape select switch to FeCr position.
2. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
3. Play back the test tape and adjust VR101 (left), VR102 (right) so that the playback frequency response is within the range as shown in Fig. 2.

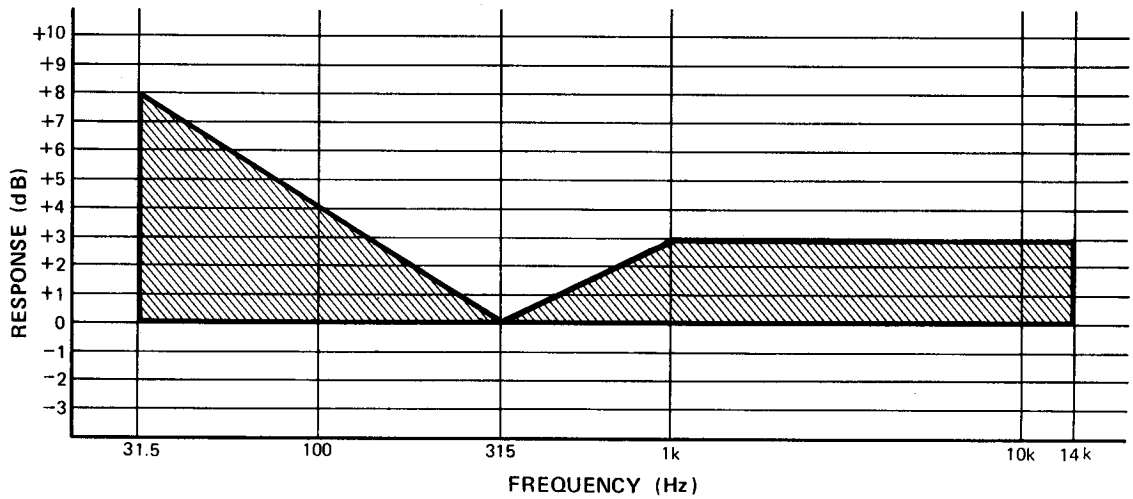


Fig. 2

ALIGNMENT PROCEDURES

RECORD BIAS TRAP ADJUSTMENT

Equipment Required: Frequency Counter and Dual Channel AC V.T.V.M.

1. Set tape select switch to METAL position.
2. Connect frequency counter and AC V.T.V.M. to TP9 and TP8 (ground).
3. Place unit in record mode.
4. Confirm that bias frequency is within the 105 kHz ±5 kHz.
5. Connect dual channel AC V.T.V.M. to TP7 (left), TP6 (right) and TP8 (ground).
6. Place unit in record mode.
7. Adjust L303, L305 (left) and L304, L306 (right) so that the output becomes minimum.

RECORD BIAS LEVEL ADJUSTMENT

Equipment Required: Audio Signal Generator, Distortion Meter, Two Dual Channel AC V.T.V.M. (1 and 2) and a Normal Blank Test Tape (TDK AC-222)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP11 (ground), and connect dual channel AC V.T.V.M. 2 and distortion meter to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 1 kHz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. 2 of 580 mV.
3. Vary the bias level as read on the V.T.V.M. 1 of 42 mV, with VR601 and record on a blank test tape.
4. Play back the test tape and read the 1.3% on distortion meter.
5. If the above distortion is not obtained, adjust VR601 slightly. Repeat steps 3 and 4 until distortion on the distortion meter is adjusted 1.3%.
6. Keep note of the bias level on V.T.V.M. 1 at the time.
7. Place unit in record mode.
8. Set tape select switch to METAL position.
9. Adjust TC601 (left) and TC602 (right) so that the bias level becomes +8.8 dB of level obtained at step 6 on V.T.V.M. 1.
10. Set tape select switch to LN position.
11. Adjust VR601 so that the bias level becomes same level obtained at step 6 on V.T.V.M. 1.
12. Set tape select switch to FeCr position.
13. Adjust VR602 so that the bias level becomes +1.8 dB of level obtained at step 6.
14. Set tape select switch to CrO_2 position.
15. Adjust VR603 so that the bias level becomes +2.5 dB of level obtained at step 6.

RECORD/PLAYBACK LEVEL ADJUSTMENT

Equipment Required: Audio Signal Generator, Dual Channel AC V.T.V.M. and a Normal (TDK AC-222), FeCr (SONY CS-30), CrO_2 (TDK AC-512) and Metal (SCOTCH M-1) Blank Test Tapes

1. Connect dual channel AC V.T.V.M. to TP 3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks.
3. Set tape select switch to METAL position.
4. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV −7 dB.
5. Recording this signal on the metal blank test tape and playing it, adjust VR301 (left) and VR302 (right) by repeating record and playback so that the output on V.T.V.M. becomes 580 mV −7 dB ±1 dB.
6. Adjust VR311 (left) and VR312 (right) for LN position as it is with METAL position by using normal test tape.
7. Adjust VR313 (left) and VR314 (right) for FeCr position as it is with METAL position by using FeCr test tape.
8. Adjust VR315 (left) and VR316 (right) for CrO_2 position as it is with METAL position by using CrO_2 test tape.

ALIGNMENT PROCEDURES

RECORD/PLAYBACK EQUALIZER FREQUENCY CHARACTERISTIC ADJUSTMENT

Equipment Required: Audio Signal Generator, Two Dual Channel AC V.T.V.M. (1 and 2) and a Normal, FeCr, CrO_2 and Metal Blank Test Tapes

1. Connect dual channel AC V.T.V.M. 1 to TP3 (left), TP2 (right) and TP1 (ground), and connect dual channel AC V.T.V.M. 2 to both left and right line output jacks.
2. Connect audio signal generator to both left and right line input jacks.
3. Set tape select switch to METAL position and Dolby NR switch to OFF position.
4. Adjust the generator input level for an output on V.T.V.M. 1 of 580 mV –25 dB, when the unit is in recording mode.
5. Record the signal from generator on to a metal blank test tape varying the generator frequency from 20 Hz to 30 kHz.
6. Play back the metal tape recorded above, note the frequency response obtained on the V.T.V.M. 2 and compare to Fig. 3.
7. If the above frequency response is not within the shaded DOLBY-NR OFF area on Fig. 3, adjust VR309 (left), VR310 (right), L301 (left peaking) and L302 (right peaking) slightly. Repeat steps 5 and 6 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 3.
8. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 3, if not repeat DOLBY-NR OFF procedures.

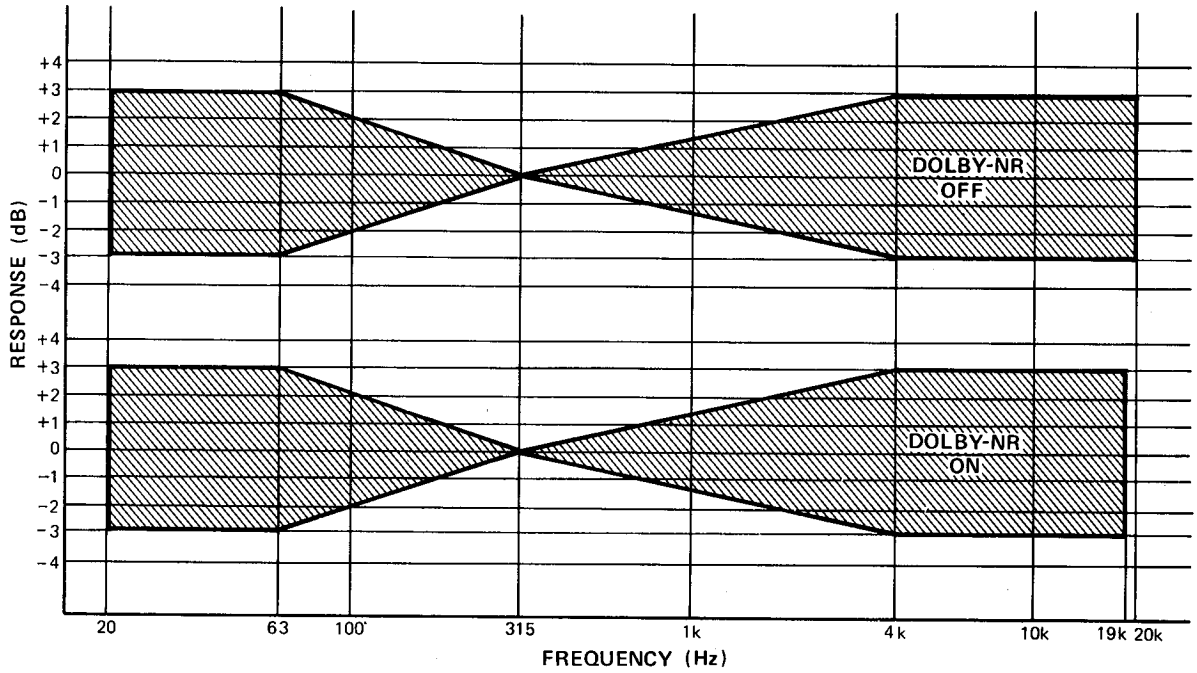


Fig. 3 – Metal

9. Set tape select switch to LN position and Dolby NR switch to OFF position.
10. Record the signal from generator on to a normal blank test tape varying the generator frequency from 20 Hz to 30 kHz.
11. Play back the normal tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
12. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 4, adjust VR303 (left) and VR304 (right) slightly. Repeat steps 10 and 11 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 4.

ALIGNMENT PROCEDURES

13. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 4, if not repeat DOLBY-NR OFF procedures.

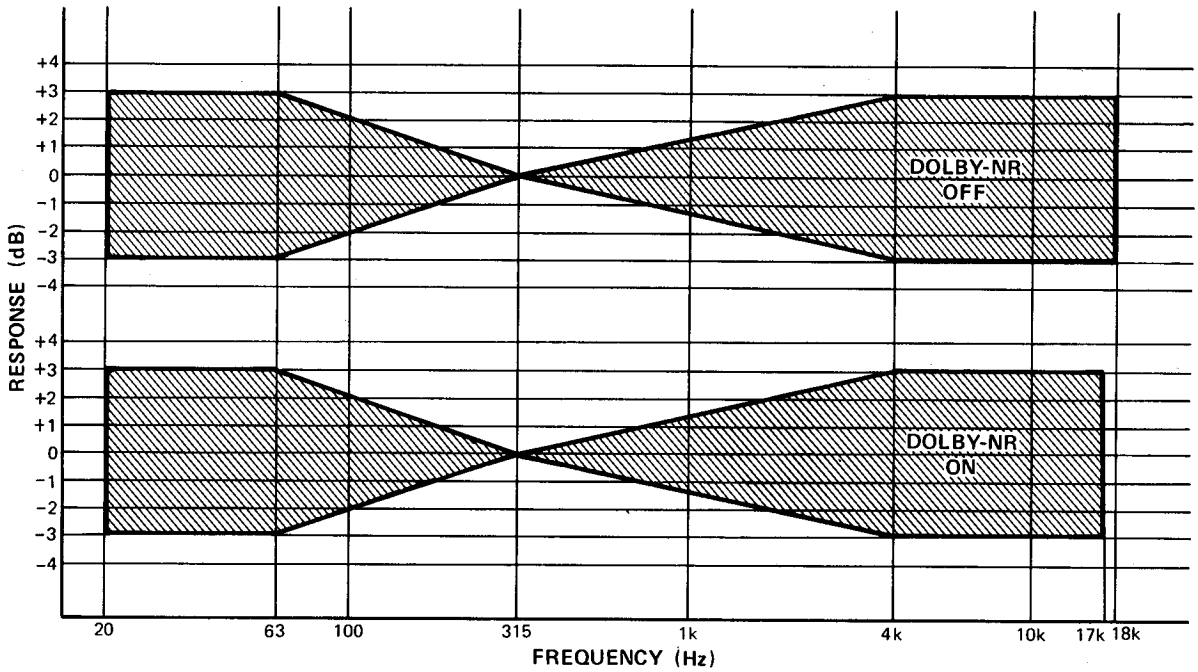


Fig. 4 — Low Noise

14. Set tape select switch to FeCr position and Dolby NR switch to OFF position.
15. Record the signal from generator on to a FeCr blank test tape varying the generator frequency from 20 Hz to 30 kHz.
16. Play back the FeCr tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
17. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 5, adjust VR305 (left) and VR306 (right) slightly. Repeat steps 15 and 16 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 5.
18. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 5, if not repeat DOLBY-NR OFF procedures.
19. Set tape select switch to CrO_2 position and Dolby NR switch to OFF position.
20. Record the signal from generator on to a CrO_2 blank test tape varying the generator frequency from 20 Hz to 30 kHz.
21. Play back the CrO_2 tape recorded above and note the frequency response obtained on the V.T.V.M. 2.
22. If the above frequency response is not within the shaded DOLBY-NR OFF area of Fig. 5, adjust VR307 (left) and VR308 (right) slightly. Repeat steps 20 and 21 until playback frequency response on the V.T.V.M. 2 is adjusted within the DOLBY-NR OFF range as shown in Fig. 5.
23. Set Dolby NR switch to ON position and check if frequency response is within range of DOLBY-NR ON section of Fig. 5, if not repeat DOLBY-NR OFF procedures.

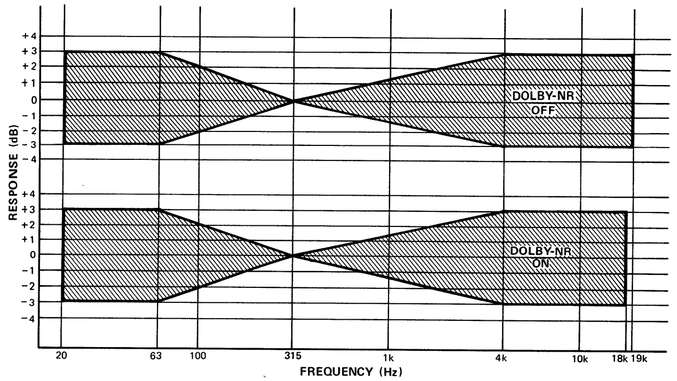


Fig. 5 — FeCr & CrO_2

DOLBY HX THRESHOLD ADJUSTMENT

Equipment Required: Audio Signal Generator and Two Dual Channel AC V.T.V.M. (1 and 2)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP1 (ground), and connect dual channel AC V.T.V.M. 2 to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 3 kHz signal. Place unit in record mode. Adjust the generator input level for an output on V.T.V.M. 2 of 580 mV.
3. Setting Dolby HX switch to ON, adjust VR501 so that the output on V.T.V.M. 1 becomes −1.8 dB of bias level obtained at Record Bias Level Adjustment instructions.
4. Adjust VR502 for FeCr position as it is with LN position.
5. Adjust VR503 for CrO_2 position as it is with LN position.
6. Adjust VR504 for METAL position as it is with LN position.

HEADROOM SAFETY DISPLAY SENSITIVITY ADJUSTMENT

Equipment Required: Audio Signal Generator, Dual Channel AC V.T.V.M. and DC V.T.V.M.

1. Set Dolby HX switch to ON position.
2. Connect DC V.T.V.M. to TP10 and TP8. Place unit in record mode.
3. Adjust VR551 so that the output will be 4V ±0.1V.
4. Confirm green LED of headroom safety is lit when VR553 is in maximum clockwise position and VR554 is in maximum counterclockwise position.
5. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
6. Connect audio signal generator to both left and right line input jacks. Set the generator for a 10 kHz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV −10 dB.
7. Adjust VR553 so that the LED light of headroom safety changes from green to yellow.
8. Adjust the generator input level so that the input level becomes +2 dB of generator input level obtained at step 6.
9. Adjust VR554 so that the LED light of headroom safety changes from yellow to red.

BIAS TONE AND DOLBY TONE ADJUSTMENT

Equipment Required: Frequency Counter and Dual Channel AC V.T.V.M.

1. Connect frequency counter and dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Set bias tone switch to ON position.
3. Adjust VR901 (left) and VR902 (right) so that the output becomes 580 mV −20 dB, when frequency is within the 12.4 kHz +1.1 kHz, −1.4 kHz on frequency counter.
4. Set record cal. tone switch to ON position.
5. Adjust VR903 so that the output becomes 580 mV, when frequency is within the 333 Hz +27 Hz, −33 Hz on frequency counter.
6. Repeat steps 3 and 5 for optimum adjustment points.

PEAK LEVEL DISPLAY SENSITIVITY ADJUSTMENT

Equipment Required: Audio Signal Generator and Dual Channel AC V.T.V.M.

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV.
3. Set bias tone switch to ON (button in) position.
4. Adjust VR701 (left) and VR702 (right) so that the 0 dB LEDs will light.
5. Set bias tone switch to OFF (button out) position.
6. Adjust VR751 (left) and VR752 (right) so that the 0 dB LEDs will light.
7. Adjust generator input level for an output on the V.T.V.M. of 580 mV −20 dB.
8. Adjust VR703 (left) and VR704 (right) so that the −20 dB LEDs will light.
9. Adjust generator input level for an output on the V.T.V.M. of 580 mV −21 dB.
10. Confirm −20 dB LEDs goes off.

PINCH ROLLER TENSION ADJUSTMENT

1. Make sure that the clearance between the pinch roller and the lever is 0.3mm when unit is in the play mode. If not, bend the lever adjusting point (A) in the arrow direction to adjust the clearance.
2. Bend the lever adjusting point (B) in the arrow directions so that the tension by pinch roller may be 310g±40g when keeping apart pinch roller from capstan (about 0.2mm) and returning it to rotate.

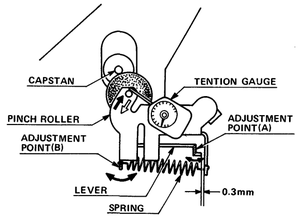
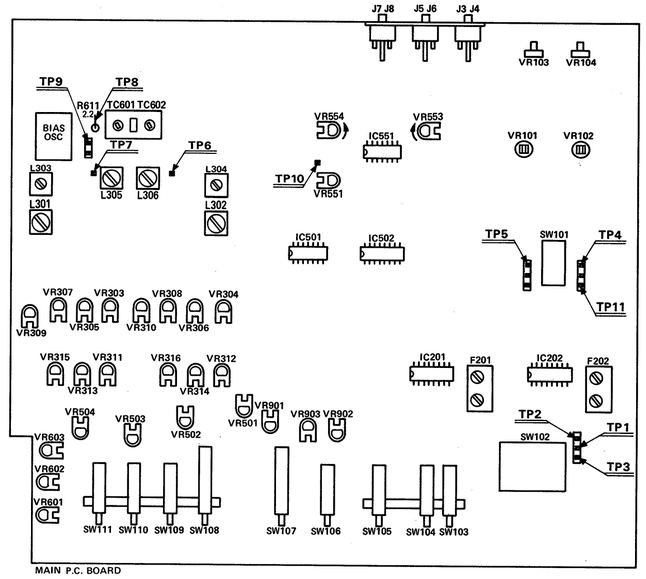
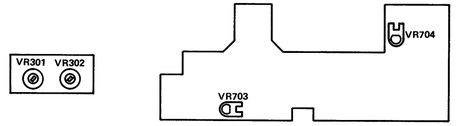


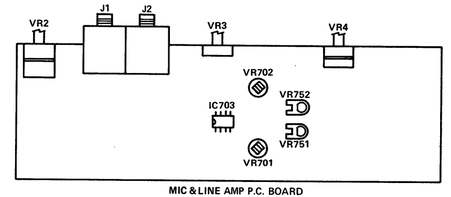
Fig. 6



MAIN P.C. BOARD



PEAK LEVEL DISPLAY P.C. BOARD
(BOTTOM VIEW)



MIC & LINE AMP P.C. BOARD

Fig. 7— Alignment Points Location

ALIGNMENT PROCEDURES

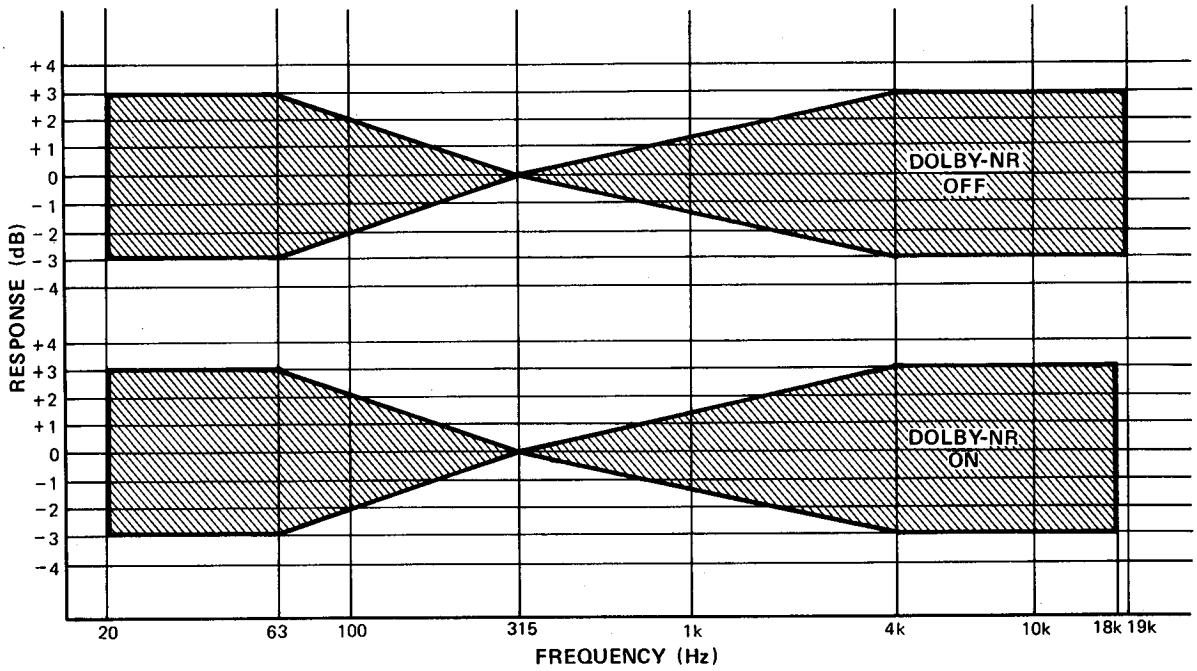


Fig. 5 – FeCr & CrO_2

DOLBY HX THRESHOLD ADJUSTMENT

Equipment Required: Audio Signal Generator and Two Dual Channel AC V.T.V.M. (1 and 2)

1. Connect dual channel AC V.T.V.M. 1 to TP5 (left), TP4 (right) and TP1 (ground), and connect dual channel AC V.T.V.M. 2 to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 3 kHz signal. Place unit in record mode. Adjust the generator input level for an output on V.T.V.M. 2 of 580 mV.
3. Setting Dolby HX switch to ON, adjust VR501 so that the output on V.T.V.M. 1 becomes –1.8 dB of bias level obtained at Record Bias Level Adjustment instructions.
4. Adjust VR502 for FeCr position as it is with LN position.
5. Adjust VR503 for CrO_2 position as it is with LN position.
6. Adjust VR504 for METAL position as it is with LN position.

HEADROOM SAFETY DISPLAY SENSITIVITY ADJUSTMENT

Equipment Required: Audio Signal Generator, Dual Channel AC V.T.V.M. and DC V.T.V.M.

1. Set Dolby HX switch to ON position.
2. Connect DC V.T.V.M. to TP10 and TP8. Place unit in record mode.
3. Adjust VR551 so that the output will be 4V ±0.1V.
4. Confirm green LED of headroom safety is lit when VR553 is in maximum clockwise position and VR554 is in maximum counterclockwise position.
5. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
6. Connect audio signal generator to both left and right line input jacks. Set the generator for a 10 kHz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV –10 dB.
7. Adjust VR553 so that the LED light of headroom safety changes from green to yellow.
8. Adjust the generator input level so that the input level becomes +2 dB of generator input level obtained at step 6.
9. Adjust VR554 so that the LED light of headroom safety changes from yellow to red.

ALIGNMENT PROCEDURES

BIAS TONE AND DOLBY TONE ADJUSTMENT

Equipment Required: Frequency Counter and Dual Channel AC V.T.V.M.

1. Connect frequency counter and dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Set bias tone switch to ON position.
3. Adjust VR901 (left) and VR902 (right) so that the output becomes 580 mV −20 dB, when frequency is within the 12.4 kHz +1.1 kHz, −1.4 kHz on frequency counter.
4. Set record cal. tone switch to ON position.
5. Adjust VR903 so that the output becomes 580 mV, when frequency is within the 333 Hz +27 Hz, −33 Hz on frequency counter.
6. Repeat steps 3 and 5 for optimum adjustment points.

PEAK LEVEL DISPLAY SENSITIVITY ADJUSTMENT

Equipment Required: Audio Signal Generator and Dual Channel AC V.T.V.M.

1. Connect dual channel AC V.T.V.M. to TP3 (left), TP2 (right) and TP1 (ground).
2. Connect audio signal generator to both left and right line input jacks. Set the generator for a 400 Hz signal. Place unit in record mode. Adjust generator input level for an output on the V.T.V.M. of 580 mV.
3. Set bias tone switch to ON (button in) position.
4. Adjust VR701 (left) and VR702 (right) so that the 0 dB LEDs will light.
5. Set bias tone switch to OFF (button out) position.
6. Adjust VR751 (left) and VR752 (right) so that the 0 dB LEDs will light.
7. Adjust generator input level for an output on the V.T.V.M. of 580 mV −20 dB.
8. Adjust VR703 (left) and VR704 (right) so that the −20 dB LEDs will light.
9. Adjust generator input level for an output on the V.T.V.M. of 580 mV −21 dB.
10. Confirm −20 dB LEDs goes off.

PINCH ROLLER TENSION ADJUSTMENT

1. Make sure that the clearance between the pinch roller and the lever is 0.3mm when unit is in the play mode. If not, bend the lever adjusting point (A) in the arrow direction to adjust the clearance.
2. Bend the lever adjusting point (B) in the arrow directions so that the tension by pinch roller may be 310g±40g when keeping apart pinch roller from capstan (about 0.2mm) and returning it to rotate.

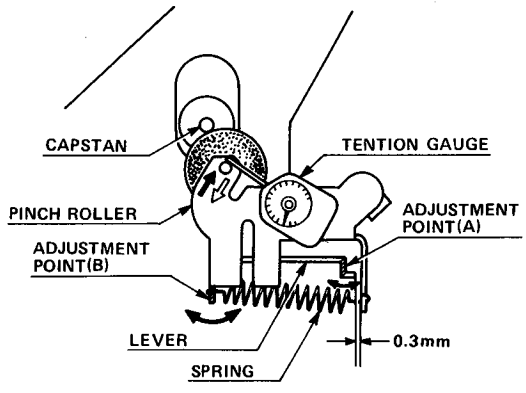
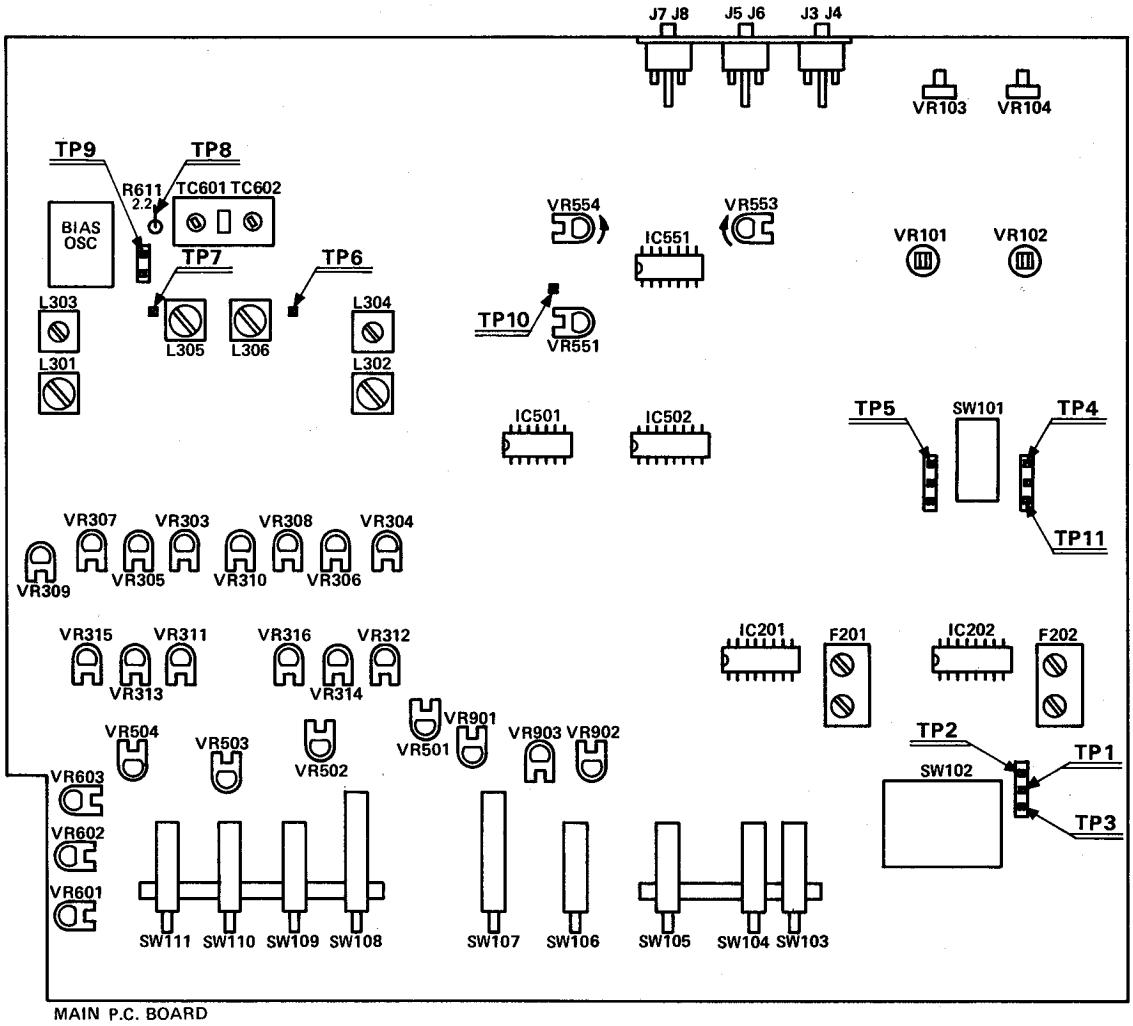
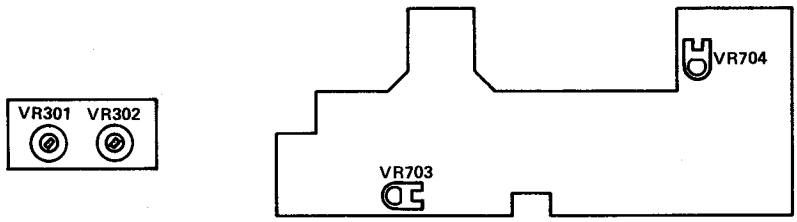


Fig. 6

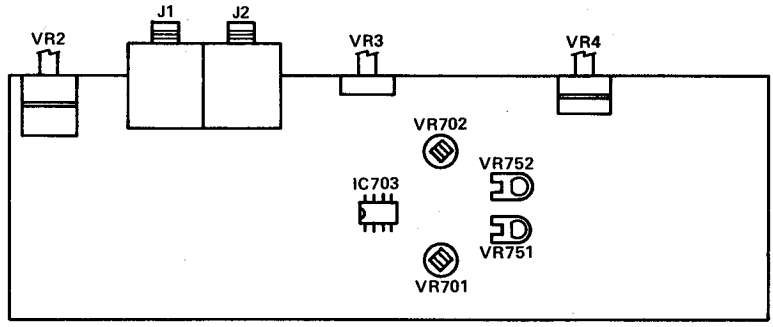
ALIGNMENT PROCEDURES



MAIN P.C. BOARD



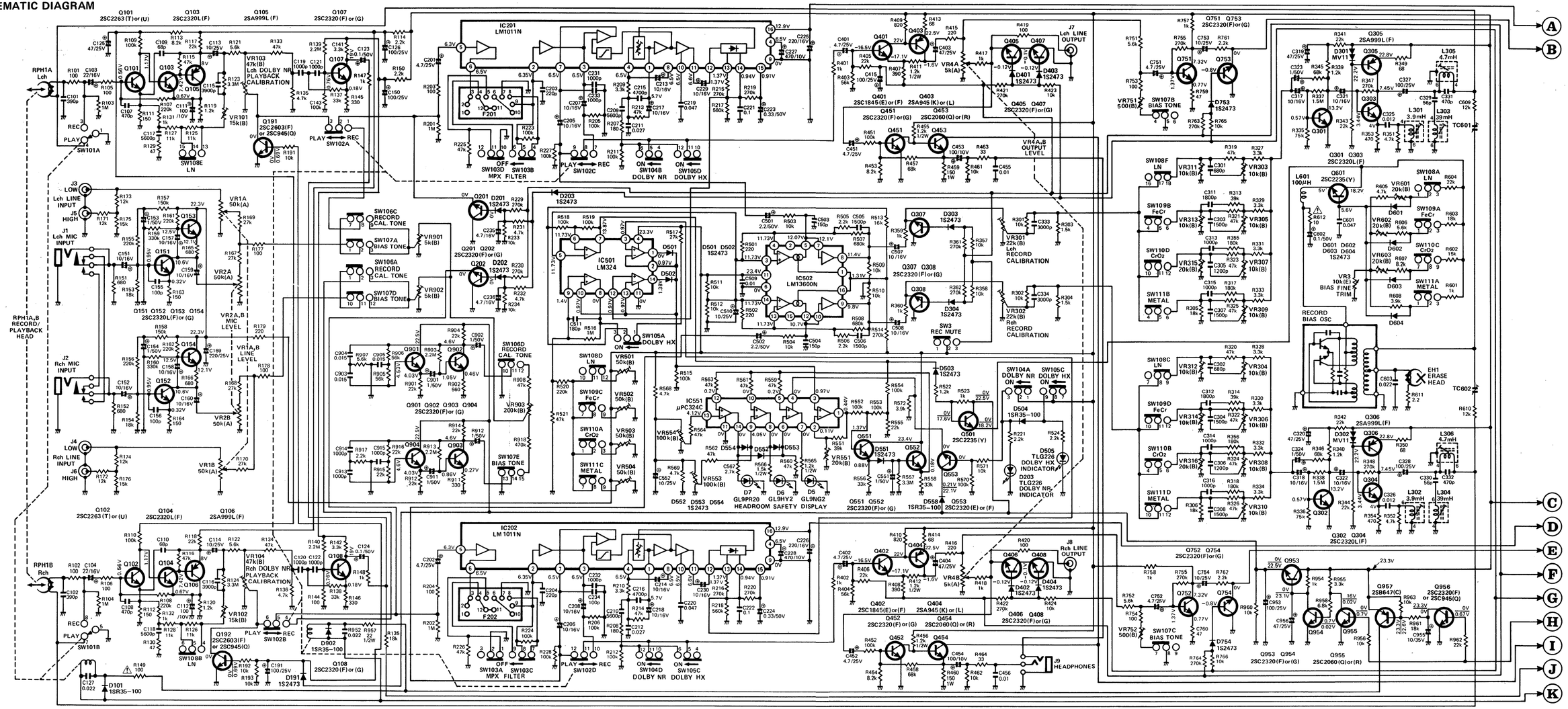
PEAK LEVEL DISPLAY P.C. BOARD
(BOTTOM VIEW)



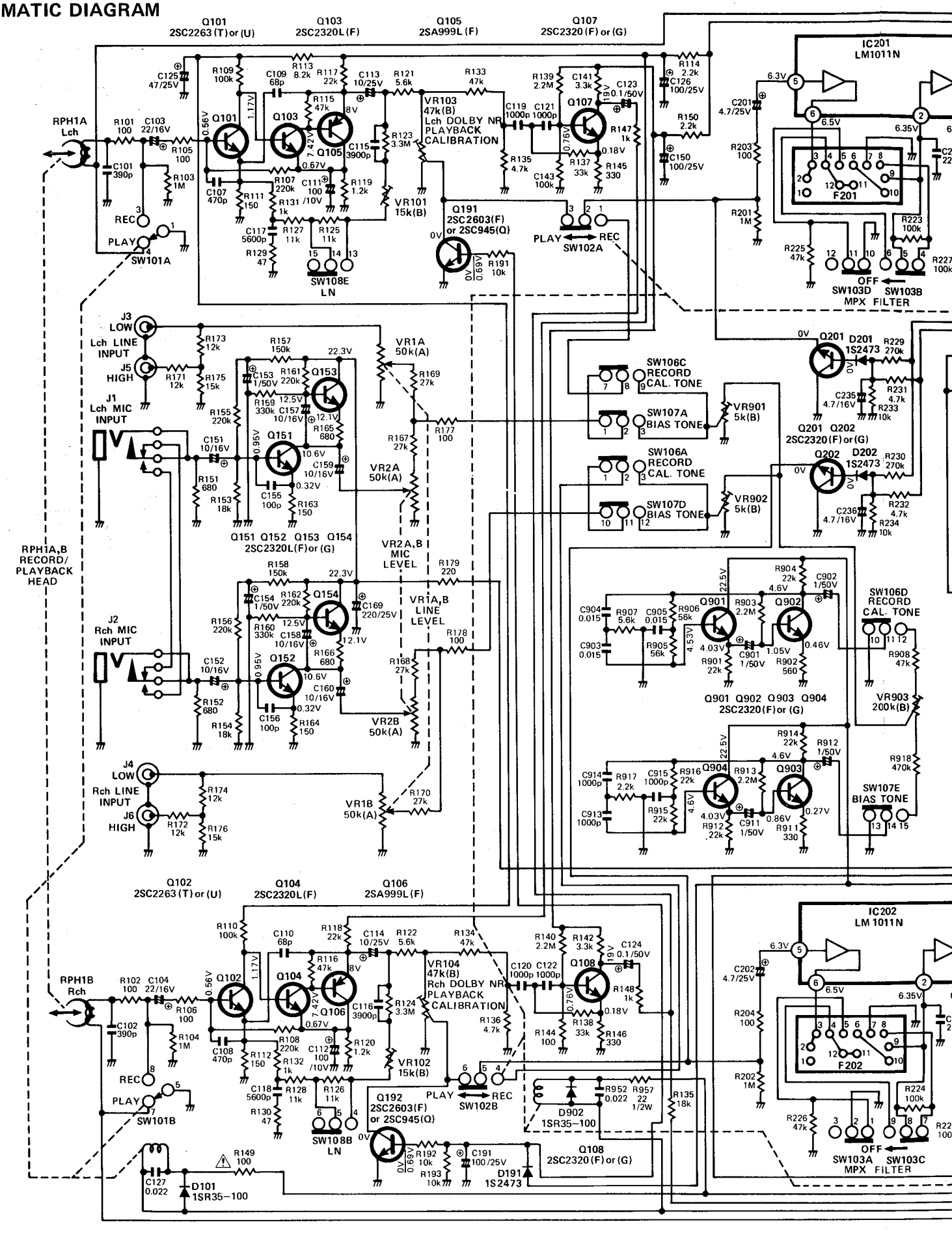
MIC & LINE AMP P.C. BOARD

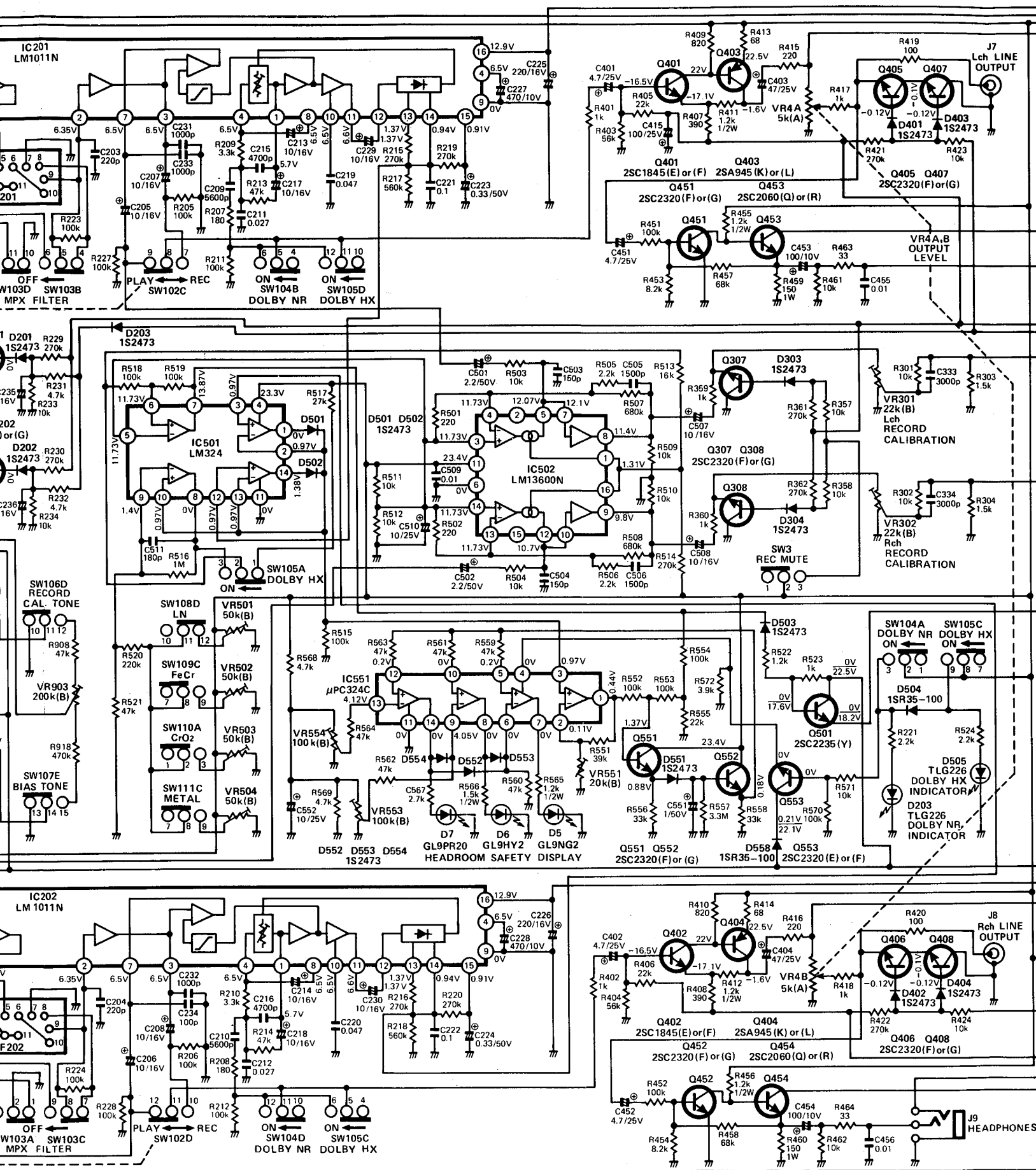
Fig. 7— Alignment Points Location

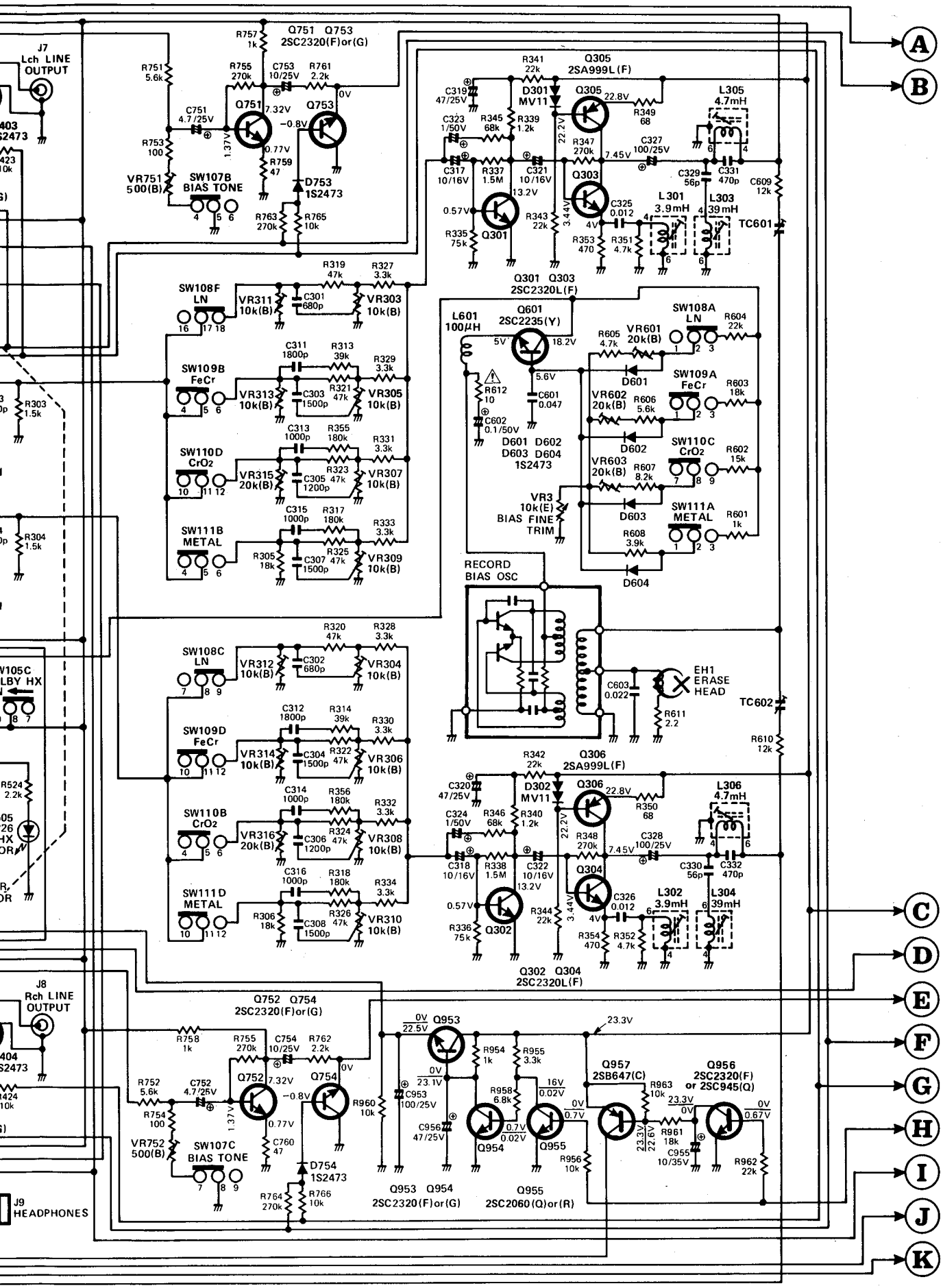
SCHEMATIC DIAGRAM



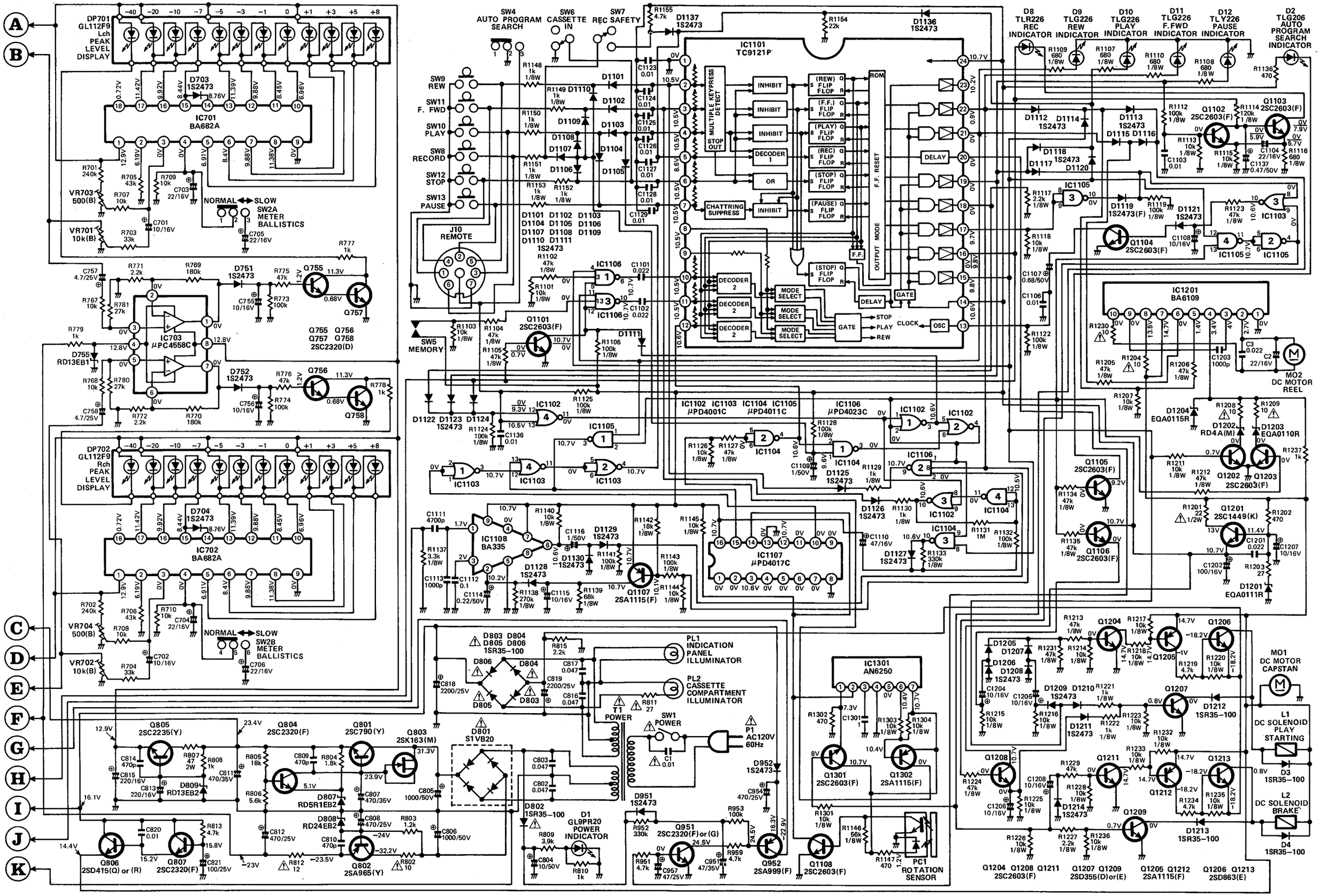
SCHEMATIC DIAGRAM




IC201
LM1011N
Q401
Q403
Q405
Q407
J7
Lch LINE
OUTPUT
Q401
2SC1845(E) or (F)
Q403
2SA945(K) or (L)
Q451
2SC2320(F) or (G)
Q453
2SC2060(Q) or (R)
Q405 Q407
2SC2320(F) or (G)
VR4A
5k(A)
VR4A,B
OUTPUT
LEVEL
D401
1S2473
D403
1S2473
OFF
SW103D
SW103B
MPX FILTER
PLAY
REC
SW102C
ON
SW104B
DOLBY NR
ON
SW105D
DOLBY HX
D201
1S2473
D202
1S2473
D203
1S2473
IC501
LM324
D501
D502
D501 D502
1S2473
IC502
LM13600N
Q307
Q308
D303
1S2473
D304
1S2473
Q307 Q308
2SC2320(F) or (G)
VR301
22k(B)
Lch
RECORD
CALIBRATION
VR302
22k(B)
Rch
RECORD
CALIBRATION
SW3
REC MUTE
SW105A
DOLBY HX
ON
SW106D
RECORD
CAL. TONE
SW108D
LN
SW109C
FeCr
SW110A
CrO2
SW111C
METAL
SW107E
BIAS TONE
VR501
50k(B)
VR502
50k(B)
VR503
50k(B)
VR504
50k(B)
VR903
200k(B)
IC551
μPC324C
VR554
100k(B)
VR553
100k(B)
VR551
20k(B)
D552
D553
D554
1S2473
D7
GL9PR20
HEADROOM
D6
GL9HY2
SAFETY
D5
GL9NG2
DISPLAY
Q551
Q552
D551
1S2473
Q551 Q552
2SC2320(F) or (G)
D503
1S2473
Q501
2SC2235(Y)
Q553
D558
1SR35-100
Q553
2SC2320(E) or (F)
SW104A
DOLBY NR
ON
SW105C
DOLBY HX
ON
D504
1SR35-100
D505
TLG226
DOLBY HX
INDICATOR
D203
TLG226
DOLBY NR,
INDICATOR
IC202
LM 1011N
Q402
Q404
Q406
Q408
J8
Rch LINE
OUTPUT
Q402
2SC1845(E) or (F)
Q404
2SA945(K) or (L)
Q452
2SC2320(F) or (G)
Q454
2SC2060(Q) or (R)
Q406 Q408
2SC2320(F) or (G)
VR4B
5k(A)
D402
1S2473
D404
1S2473
OFF
SW103A
SW103C
MPX FILTER
PLAY
REC
SW102D
ON
SW104D
DOLBY NR
ON
SW105C
DOLBY HX
J9
HEADPHONES

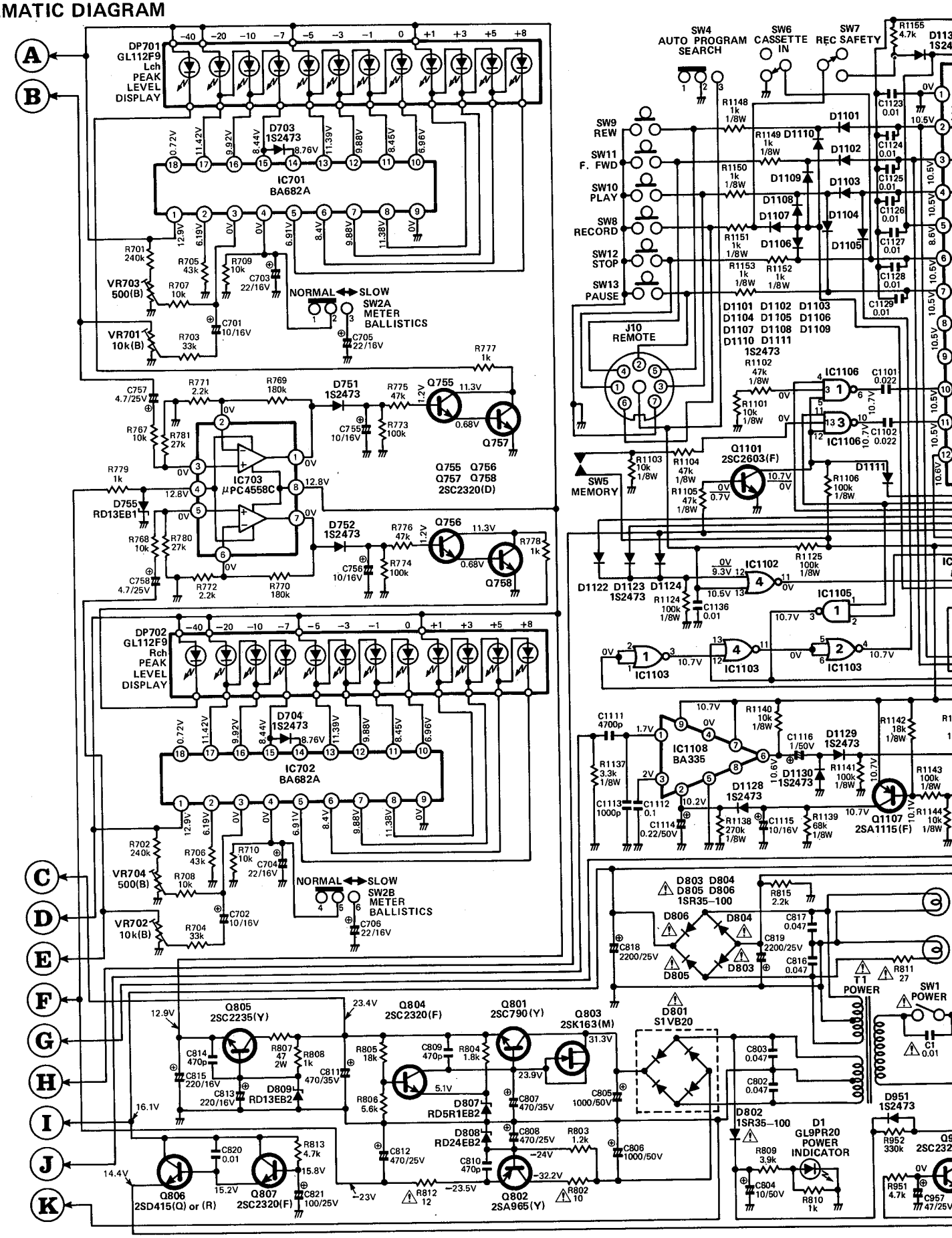

J7
Lch LINE OUTPUT
Q751 Q753
2SC2320(F)or(G)
Q751
Q753
VR751
500(B)
SW107B
BIAS TONE
D753
1S2473
Q305
2SA999L(F)
D301
MV11
Q303
Q301
L305
4.7mH
L301
3.9mH
L303
39mH
TC601
Q301 Q303
2SC2320L(F)
SW108F
LN
VR311
10k(B)
VR303
10k(B)
SW109B
FeCr
VR313
10k(B)
VR305
10k(B)
SW110D
CrO2
VR315
20k(B)
VR307
10k(B)
SW111B
METAL
VR309
10k(B)
L601
100μH
Q601
2SC2235(Y)
D601
D602
D603
D604
1S2473
SW108A
LN
VR601
20k(B)
SW109A
FeCr
VR602
20k(B)
SW110C
CrO2
VR603
20k(B)
SW111A
METAL
VR3
10k(E)
BIAS FINE
TRIM
RECORD
BIAS OSC
EH1
ERASE
HEAD
TC602
SW108C
LN
VR312
10k(B)
VR304
10k(B)
SW109D
FeCr
VR314
10k(B)
VR306
10k(B)
SW110B
CrO2
VR316
20k(B)
VR308
10k(B)
SW111D
METAL
VR310
10k(B)
Q302 Q304
2SC2320L(F)
J8
Rch LINE OUTPUT
Q752 Q754
2SC2320(F)or(G)
Q752
Q754
VR752
500(B)
SW107C
BIAS TONE
D754
1S2473
Q953 Q954
2SC2320(F)or(G)
Q955
2SC2060(Q)or(R)
Q957
2SB647(C)
Q956
2SC2320(F)
or 2SC945(Q)
J9
HEADPHONES
A
B
C
D
E
F
G
H
I
J
K

SCHEMATIC DIAGRAM

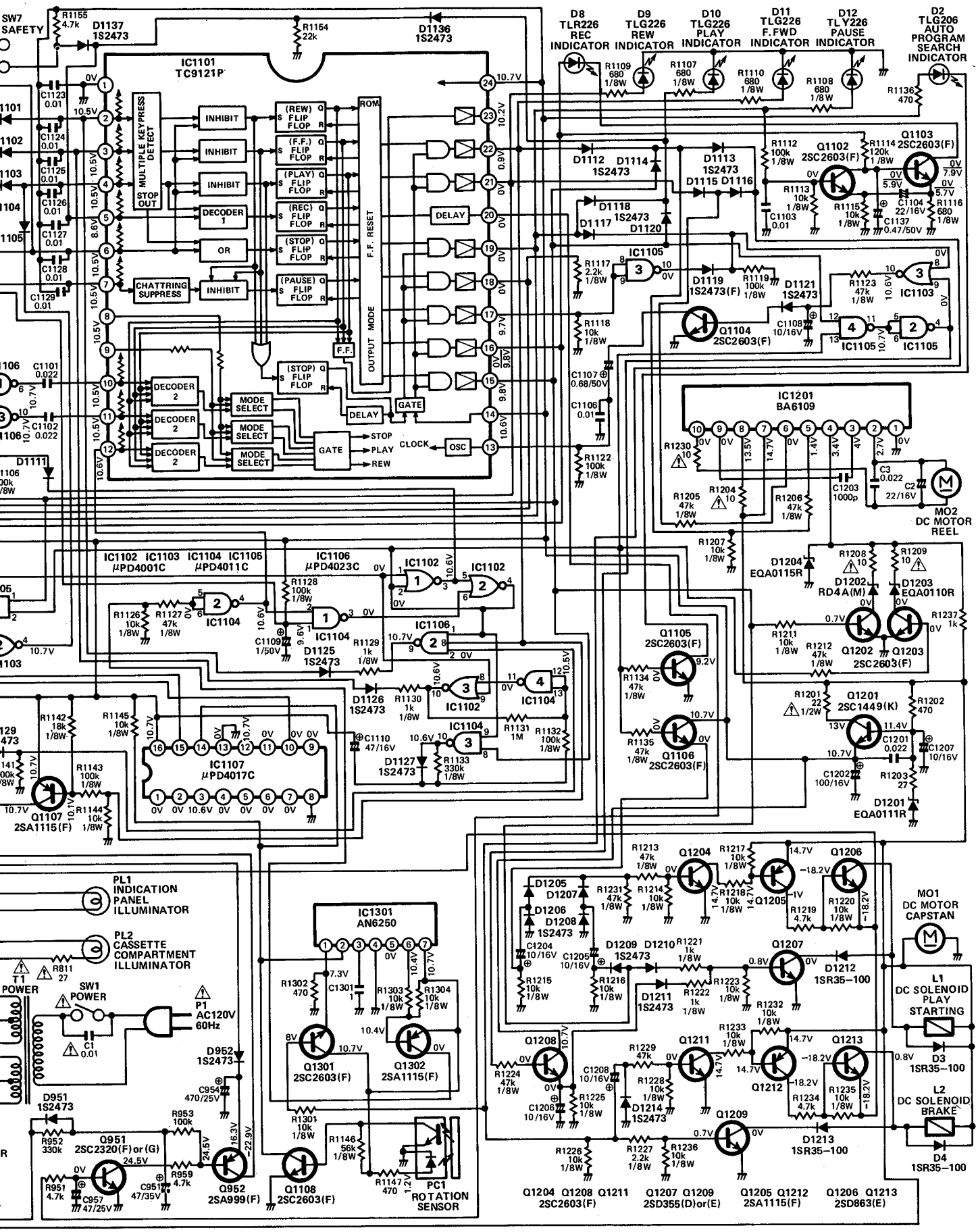


NOTES:
1. ALL RESISTANCES ARE 1/4 WATTS, UNLESS OTHERWISE NOTED, VALUES ARE IN Ω. KΩ = 1000 Ω, M = 1000 KΩ.
2. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. pF = μμF
3. ALL VOLTAGES READING FROM CHASSIS ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL CONDITIONS. PLAY / REC
4. ⚠ SAFETY-REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

SCHEMATIC DIAGRAM



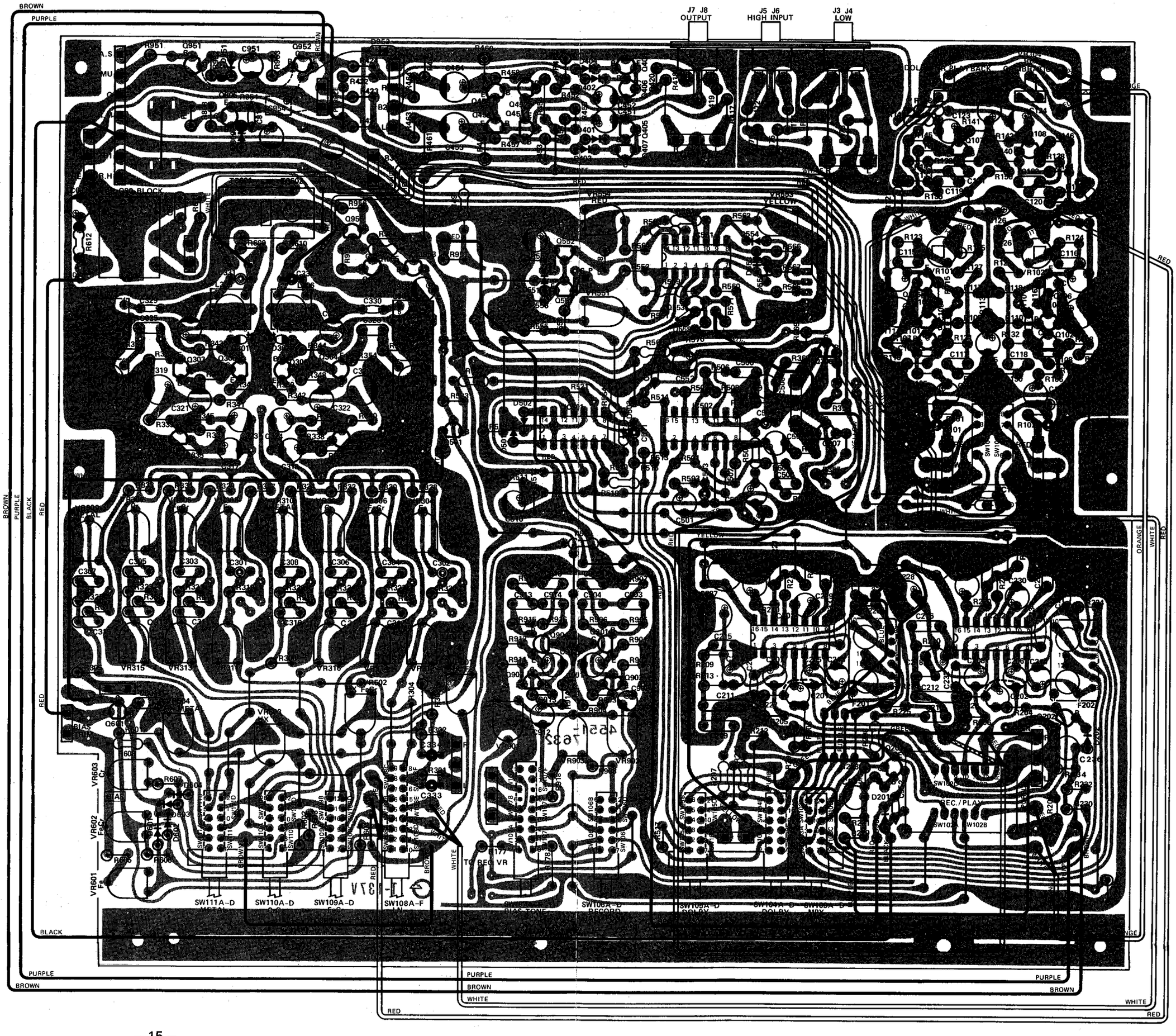
NOTES: 1. ALL RESISTANCES ARE 1/4 WATTS, UNLESS OTHERWISE NOTED, VALUES ARE IN Ω. KΩ = 1000 Ω, M = 1000 KΩ.
2. ALL CAPACITANCES VALUES ARE IN μF UNLESS OTHERWISE NOTED. pF = μμF



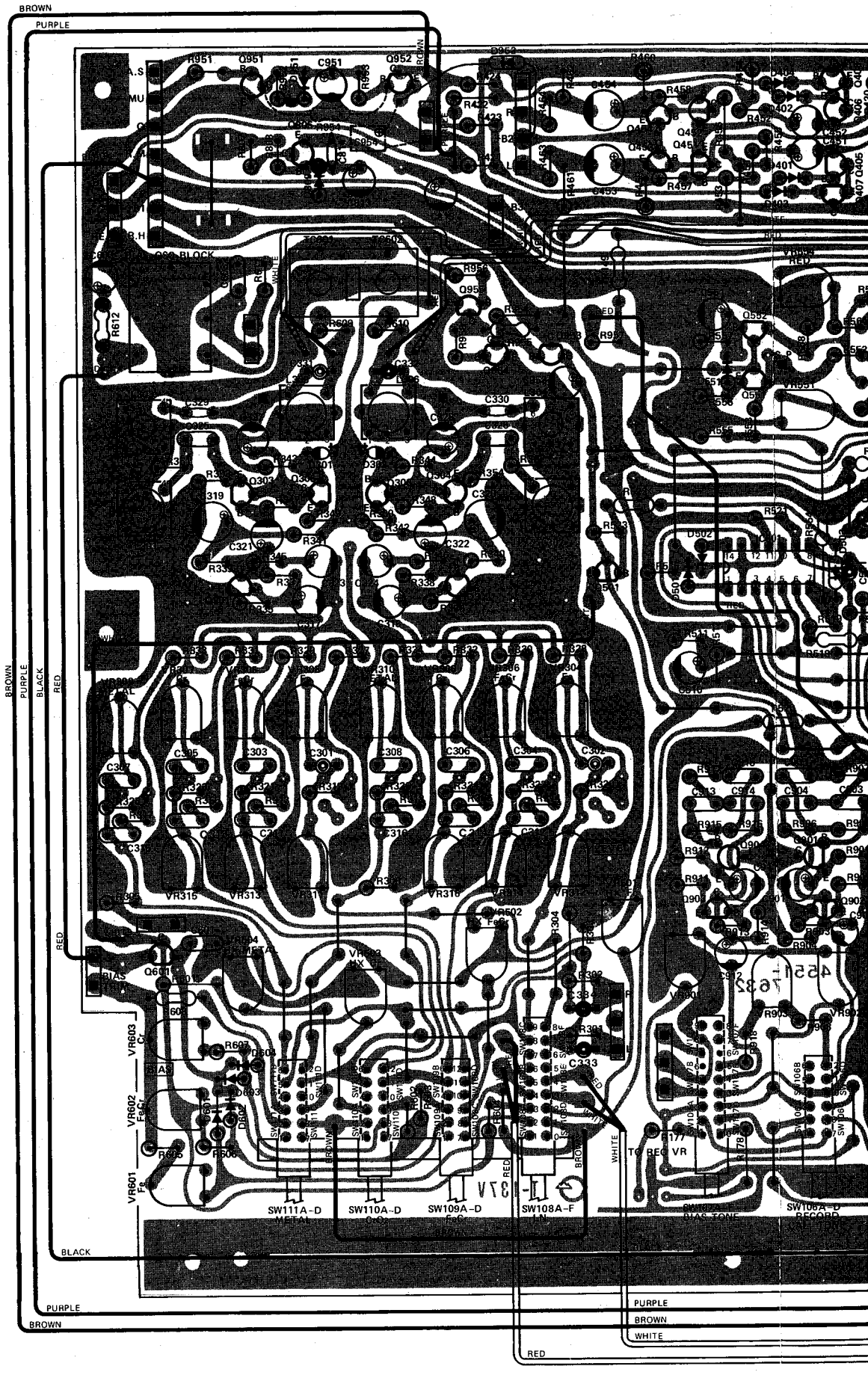
1 = 1000 KΩ.

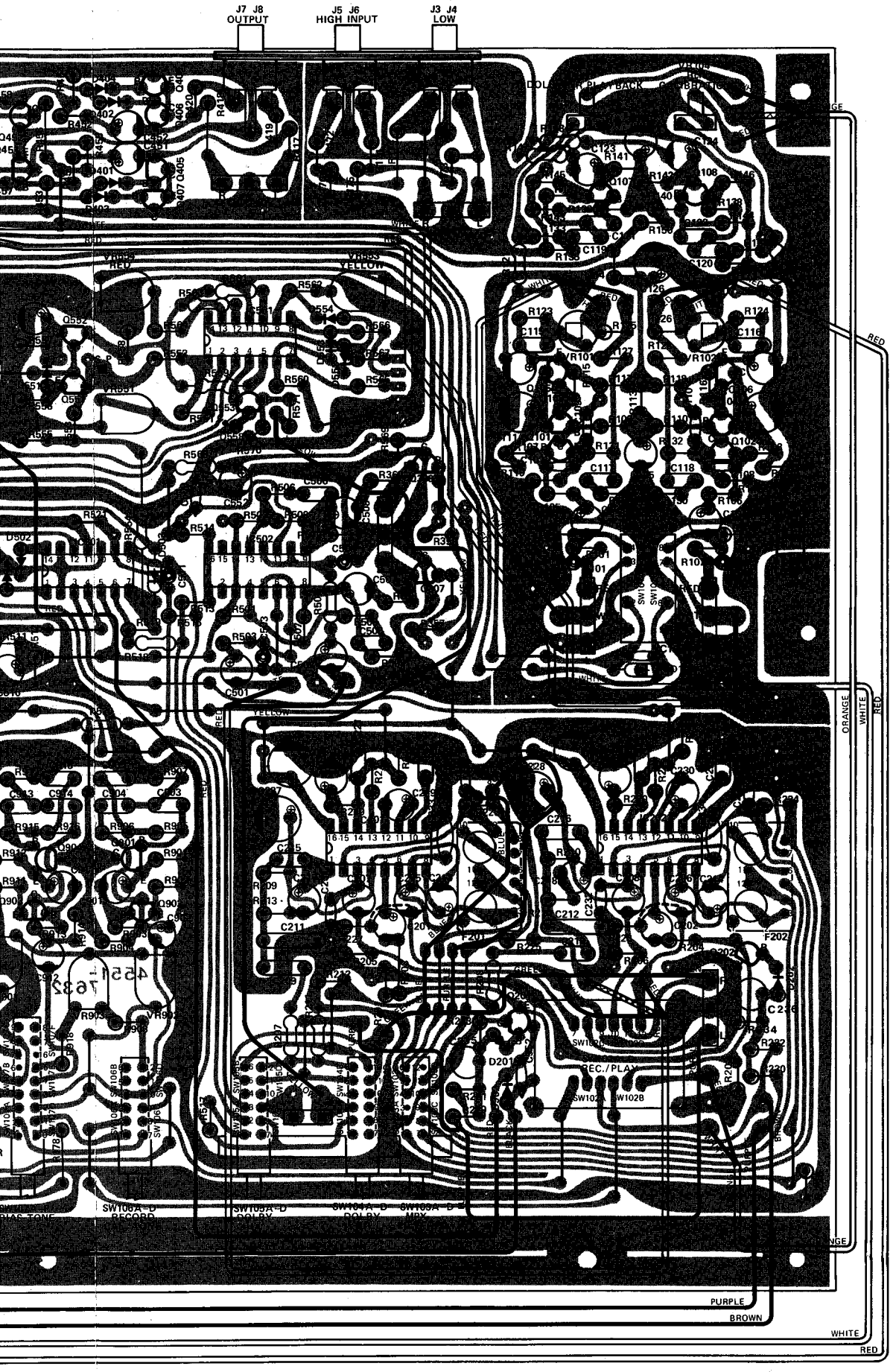
3. ALL VOLTAGES READING FROM CHASSIS ARE MEASURED WITH V.T.V.M. UNDER NO SIGNAL CONDITIONS. PLAY / REC
4. ⚠ SAFETY-REQUIREMENTS COMPONENTS IN ACCORDANCE WITH PRESENT SAFETY REGULATIONS, THESE COMPONENTS MUST ONLY BE REPLACED BY ORIGINAL PARTS.

MAIN P.C. BOARD



MAIN P.C. BOARD




J7 J8
OUTPUT
J5 J6
HIGH INPUT
J3 J4
LOW
ORANGE
WHITE
RED
PURPLE
BROWN
WHITE
RED
REC./PLAY

MAIN P.C. BOARD

Ref. No.	Part No.	Description
	RESISTORS	
R149	5102-1014713	100 Ω ±2% 1/4W Fuse
R612	5102-1004713	10 Ω±2% 1/4W Fuse
VR101, 102	5101-1538274	Variable Resistor, 15 kΩ
VR103, 104	5101-4737179	Variable Resistor, 47 kΩ Dolby NR Playback Calibration Control
VR303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314	5101-10371913	Variable Resistor, 10 kΩ
VR315, 316, 551, 601, 602, 603	5101-20371913	Variable Resistor, 20 kΩ
VR501, 502, 503, 504	5101-50371913	Variable Resistor, 50 kΩ
VR553, 554	5101-10471913	Variable Resistor, 100 kΩ
VR901, 902	5101-50271913	Variable Resistor, 5 kΩ
VR903	5101-20471913	Variable Resistor, 200 kΩ
	CAPACITORS, ELECTROLYTIC	
C103, 104	5345-226C0212	22 μF ±20% 16V
C111, 112, 453, 454	5345-107-10	100 μF +50%–10% 10V
C113, 114	5345-106D0212	10 μF ±20% 25V
C123, 124, 602	5345-104F0212	0.1 μF ±20% 50V
C125, 319, 320	5345-476-25	47 μF +50%–10% 25V
C126, 953	5345-107-25	100 μF +50%–10% 25V
C150	5345-107D041	100 μF +50%–10% 25V
C201, 202	5345-475D0212	4.7 μF ±20% 25V
C205, 206, 207, 208, 213, 214, 217, 218, 229, 230, 321, 322, 507, 508	5345-106-16	10 μF +50%–10% 16V
C223, 224	5345-334F0212	0.33 μF ±20% 50V
C225, 226, 813, 815	5345-227-16	220 μF +50%–10% 16V
C227, 228	5345-477-10	470 μF +50%–10% 10V
C235, 236	5342-475C0951	4.7 μF ±20% 16V
C317, 318	5345-106C0212	10 μF±20% 16V
C323, 324, 551, 901, 902, 911, 912	5345-105-50	1 μF +75%–10% 50V
C327, 328	5345-107D0212	100 μF ±20% 25V
C451, 452	5345-475-25	4.7 μF +50%–10% 25V
C501, 502	5345-225F0212	2.2 μF ±20% 50V
C510, 552	5345-106-25	10 μF +50%–10% 25V
C951	5345-476E0211	47 μF ±20% 35V
C954	5345-477D041	470 μF +50%–10% 25V
TC601, 602	5372-61	Trimmer Capacitor
	INTEGRATED CIRCUITS	
IC201, 202	5652-LM1011N	LM1011N Dolby NR Amp.
IC501	5652-LM324	LM324 Dolby HX Control
IC502	5652-LM13600N	LM13600N Dolby HX Variable Equalizer
IC551	5652-μPC324C	μPC324C Headroom Safety Indicators Driver
	TRANSISTORS	
Q101, 102	5613-2263(T)	2SC2263(T) or (U) Play Equalizer Amp.
Q103, 104	5613-2320L(F)	2SC2320L(F) Play Equalizer Amp.
Q105, 106	5611-999L(F)	2SA999L(F) Play Equalizer Amp.
Q107, 108	5613-2320(F)	2SC2320(F) or (G) Auto Program Search Amp.
Q201, 202	5613-2320(F)	2SC2320(F) or (G) Muting
Q301, 302, 303, 304	5613-2320L(F)	2SC2320L(F) Rec. Equalizer Amp.
Q305, 306	5611-999L(F)	2SA999L(F) Rec. Equalizer Amp.
Q307, 308	5613-2320(F)	2SC2320(F) or (G) Rec. Mute

Ref. No.	Part No.	Description
	TRANSISTORS (continued)	
Q405, 406, 407, 408	5613-2320(F)	2SC2320(F) or (G) Audio Muting
Q451, 452	5613-2320(F)	2SC2320(F) or (G) Buffer Amp.
Q453, 454	5613-2060(Q)	2SC2060(Q) or (R) Headphones Amp.
Q501	5613-2235(Y)	2SC2235(Y) Dolby HX Bias Control
Q551, 552	5613-2320(F)	2SC2320(F) or (G) Headroom Safety Control
Q553	5613-2320(E)	2SC2320(E) or (F) Headroom Safety Switching
Q601	5613-2235(Y)	2SC2235(Y) Bias Control
Q805	5613-2235(Y)	2SC2235(Y) Voltage Regulator
Q901, 902	5613-2320(F)	2SC2320(F) or (G) Record Calibration Tone Osc. (333 Hz)
Q903, 904	5613-2320(F)	2SC2320(F) or (G) Bias Tone Osc. (12.4 kHz)
Q951	5613-2320(F)	2SC2320(F) or (G) Muting Control
Q952	5611-999(F)	2SA999(F) Muting Control
Q953	5613-2060(Q)	2SC2060(Q) or (R) Rec./Play Switching
Q954, 955	5613-2320(F)	2SC2320(F) or (G) Rec./Play Switching
	DIODES	
D101, 902	5632-1SR35-10	1SR35-100
D201, 202, 401, 402, 403, 404, 501, 502, 503, 551, 552, 553, 554, 601, 602, 603, 604, 951, 952	5631-1S2473	1S2473
D301, 302	5641-MV11	Varistor, MV11
D809	5635-RD13EB2	Zener, RD13EB2
	COILS	
L301, 302	5933-70316	3.9 mH Peaking
L303, 304	5933-70214	39 mH Bias Trap
L305, 306	5933-70416	4.7 mH Bias Trap
	MISCELLANEOUS	
F201, 202	5214-18	LC Components, MPX Filter
	6171-0401	Complex, Bias Oscillator
SW101A, B	4331-2024736	DC Relay, Record/Playback
SW102A-D	4421-0427119	Slide Switch with Magnet, Record/Playback
SW103A-D, 104A-D, 105A-D	4431-03127450	3-Gang Push Switch, MPX Filter, Dolby NR, Dolby HX
SW106A-D	4431-01047494	Push Switch, Record Calibration Tone
SW107A-F	4431-01067594	Push Switch, Bias Tone
SW108A-F, 109A-D, 110A-D, 111A-D	4431-04187257	4-Gang Push Switch, Tape Selector
J3, 4, 5, 6, 7, 8	4486-7	6-Pin Jack, Line Input & Line Output

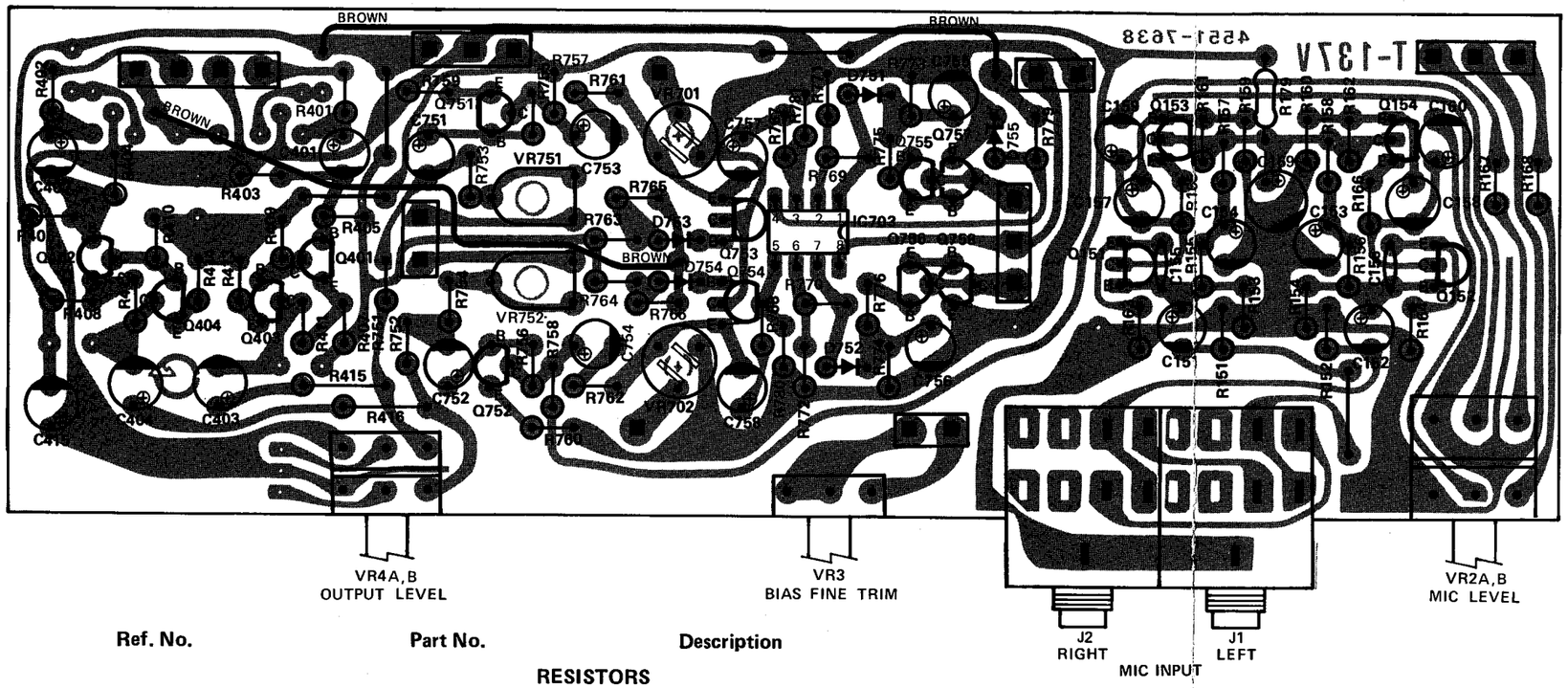
MAIN P.C. BOARD

Ref. No.	Part No.	Description
	RESISTORS	
R149	5102-1014713	100 Ω ±2% 1/4W Fuse
R612	5102-1004713	10 Ω±2% 1/4W Fuse
VR101, 102	5101-1538274	Variable Resistor, 15 kΩ
VR103, 104	5101-4737179	Variable Resistor, 47 kΩ Dolby NR Playback Calibration Control
VR303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314	5101-10371913	Variable Resistor, 10 kΩ
VR315, 316, 551, 601, 602, 603	5101-20371913	Variable Resistor, 20 kΩ
VR501, 502, 503, 504	5101-50371913	Variable Resistor, 50 kΩ
VR553, 554	5101-10471913	Variable Resistor, 100 kΩ
VR901, 902	5101-50271913	Variable Resistor, 5 kΩ
VR903	5101-20471913	Variable Resistor, 200 kΩ
	CAPACITORS, ELECTROLYTIC	
C103, 104	5345-226C0212	22 μF ±20% 16V
C111, 112, 453, 454	5345-107-10	100 μF +50%–10% 10V
C113, 114	5345-106D0212	10 μF ±20% 25V
C123, 124, 602	5345-104F0212	0.1 μF ±20% 50V
C125, 319, 320	5345-476-25	47 μF +50%–10% 25V
C126, 953	5345-107-25	100 μF +50%–10% 25V
C150	5345-107D041	100 μF +50%–10% 25V
C201, 202	5345-475D0212	4.7 μF ±20% 25V
C205, 206, 207, 208, 213, 214, 217, 218, 229, 230, 321, 322, 507, 508	5345-106-16	10 μF +50%–10% 16V
C223, 224	5345-334F0212	0.33 μF ±20% 50V
C225, 226, 813, 815	5345-227-16	220 μF +50%–10% 16V
C227, 228	5345-477-10	470 μF +50%–10% 10V
C235, 236	5342-475C0951	4.7 μF ±20% 16V
C317, 318	5345-106C0212	10 μF±20% 16V
C323, 324, 551, 901, 902, 911, 912	5345-105-50	1 μF +75%–10% 50V
C327, 328	5345-107D0212	100 μF ±20% 25V
C451, 452	5345-475-25	4.7 μF +50%–10% 25V
C501, 502	5345-225F0212	2.2 μF ±20% 50V
C510, 552	5345-106-25	10 μF+50%–10% 25V
C951	5345-476E0211	47 μF ±20% 35V
C954	5345-477D041	470 μF +50%–10% 25V
TC601, 602	5372-61	Trimmer Capacitor
	INTEGRATED CIRCUITS	
IC201, 202	5652-LM1011N	LM1011N Dolby NR Amp.
IC501	5652-LM324	LM324 Dolby HX Control
IC502	5652-LM13600N	LM13600N Dolby HX Variable Equalizer
IC551	5652-μPC324C	μPC324C Headroom Safety Indicators Driver
	TRANSISTORS	
Q101, 102	5613-2263(T)	2SC2263(T) or (U) Play Equalizer Amp.
Q103, 104	5613-2320L(F)	2SC2320L(F) Play Equalizer Amp.
Q105, 106	5611-999L(F)	2SA999L(F) Play Equalizer Amp.
Q107, 108	5613-2320(F)	2SC2320(F) or (G) Auto Program Search Amp.
Q201, 202	5613-2320(F)	2SC2320(F) or (G) Muting
Q301, 302, 303, 304	5613-2320L(F)	2SC2320L(F) Rec. Equalizer Amp.
Q305, 306	5611-999L(F)	2SA999L(F) Rec. Equalizer Amp.
Q307, 308	5613-2320(F)	2SC2320(F) or (G) Rec. Mute

MAIN P.C.BOARD

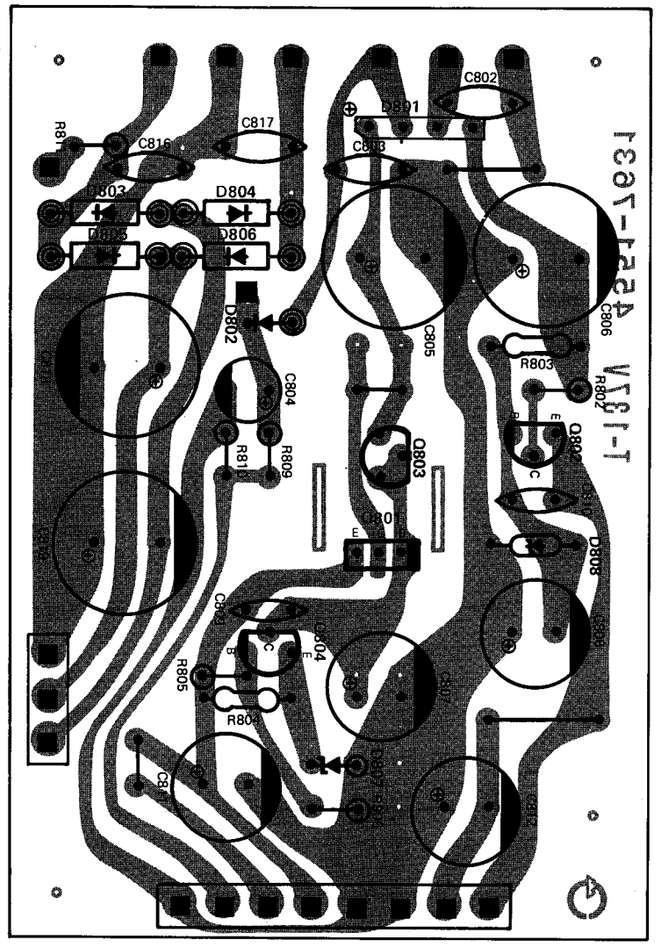
Ref. No.	Part No.	Description
	TRANSISTORS (continued)	
Q405, 406, 407, 408	5613-2320(F)	2SC2320(F) or (G) Audio Muting
Q451, 452	5613-2320(F)	2SC2320(F) or (G) Buffer Amp.
Q453, 454	5613-2060(Q)	2SC2060(Q) or (R) Headphones Amp.
Q501	5613-2235(Y)	2SC2235(Y) Dolby HX Bias Control
Q551, 552	5613-2320(F)	2SC2320(F) or (G) Headroom Safety Control
Q553	5613-2320(E)	2SC2320(E) or (F) Headroom Safety Switching
Q601	5613-2235(Y)	2SC2235(Y) Bias Control
Q805	5613-2235(Y)	2SC2235(Y) Voltage Regulator
Q901, 902	5613-2320(F)	2SC2320(F) or (G) Record Calibration Tone Osc. (333 Hz)
Q903, 904	5613-2320(F)	2SC2320(F) or (G) Bias Tone Osc. (12.4 kHz)
Q951	5613-2320(F)	2SC2320(F) or (G) Muting Control
Q952	5611-999(F)	2SA999(F) Muting Control
Q953	5613-2060(Q)	2SC2060(Q) or (R) Rec./Play Switching
Q954, 955	5613-2320(F)	2SC2320(F) or (G) Rec./Play Switching
	DIODES	
D101, 902	5632-1SR35-10	1SR35-100
D201, 202, 401, 402, 403, 404, 501, 502, 503, 551, 552, 553, 554, 601, 602, 603, 604, 951, 952	5631-1S2473	1S2473
D301, 302	5641-MV11	Varistor, MV11
D809	5635-RD13EB2	Zener, RD13EB2
	COILS	
L301, 302	5933-70316	3.9 mH Peaking
L303, 304	5933-70214	39 mH Bias Trap
L305, 306	5933-70416	4.7 mH Bias Trap
	MISCELLANEOUS	
F201, 202	5214-18	LC Components, MPX Filter
	6171-0401	Complex, Bias Oscillator
SW101A, B	4331-2024736	DC Relay, Record/Playback
SW102A-D	4421-0427119	Slide Switch with Magnet, Record/Playback
SW103A-D, 104A-D, 105A-D	4431-03127450	3-Gang Push Switch, MPX Filter, Dolby NR, Dolby HX
SW106A-D	4431-01047494	Push Switch, Record Calibration Tone
SW107A-F	4431-01067594	Push Switch, Bias Tone
SW108A-F, 109A-D, 110A-D, 111A-D	4431-04187257	4-Gang Push Switch, Tape Selector
J3, 4, 5, 6, 7, 8	4486-7	6-Pin Jack, Line Input & Line Output

MIC. & LINE AMP. P.C. BOARD



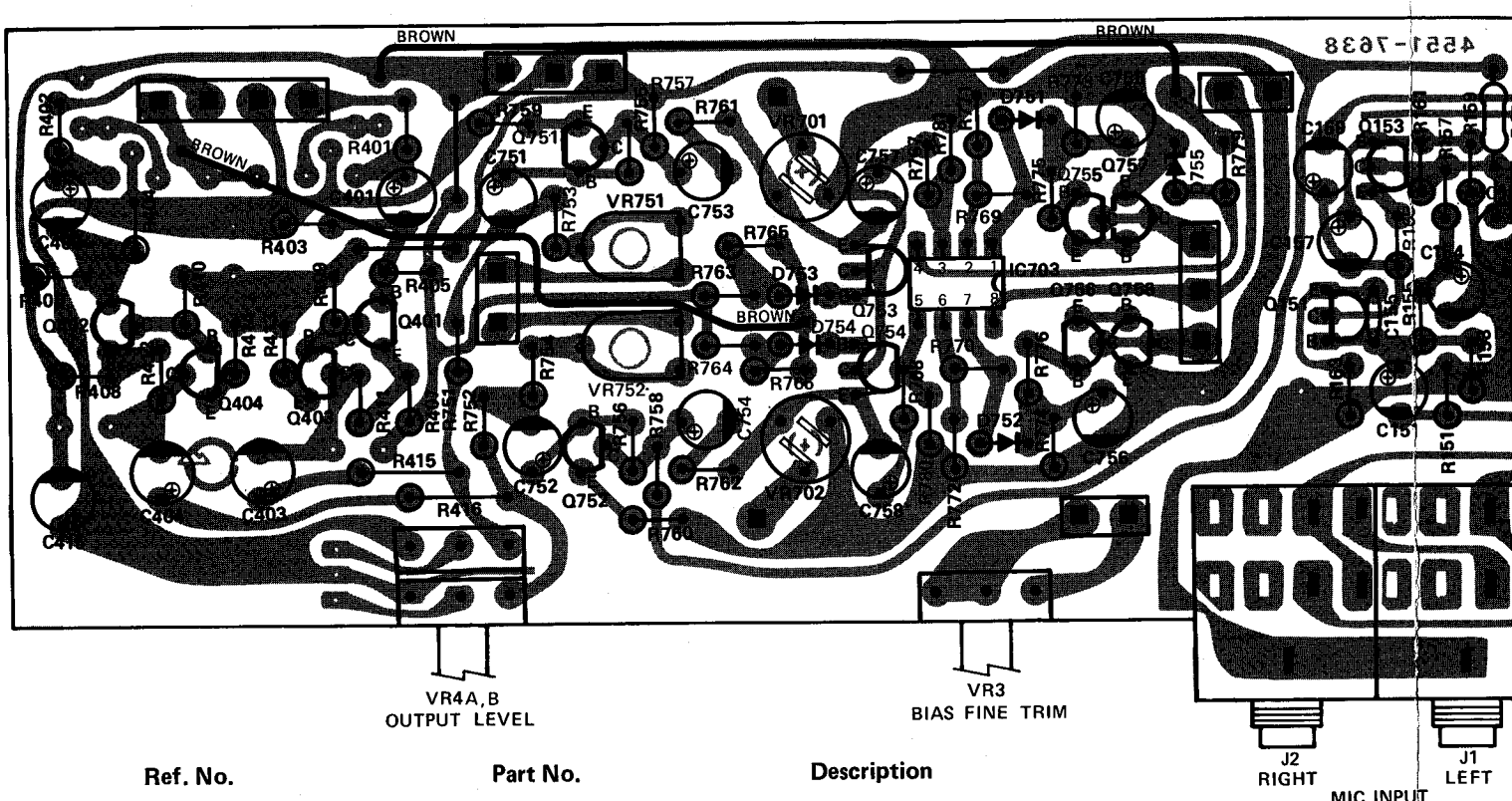
Ref. No.	Part No.	Description
	RESISTORS	
VR2A, B	5113-5037182	Variable Resistor, 50 kΩ Mic. Level Control
VR3	5113-1037621	Variable Resistor, 10 kΩ Bias Fine Trim Control
VR4A, B	5113-5027F40	Variable Resistor, 5 kΩ Output Level Control
VR701, 702	5101-1037374	Variable Resistor, 10 kΩ
VR751, 752	5101-50171913	Variable Resistor, 500 Ω
	CAPACITORS, ELECTROLYTIC	
C151, 152, 159, 160	5345-106C0212	10 μF ±20% 16V
C153, 154	5345-105-50	1 μF +75%–10% 50V
C157, 158, 755, 756	5345-106-16	10 μF +50%–10% 16V
C169	5345-227D041	220 μF +50%–10% 25V
C401, 402	5345-475D0212	4.7 μF ±20% 25V
C403, 404	5345-476-25	47 μF +50%–10% 25V
C415	5345-107-25	100 μF +50%–10% 25V
C751, 752, 757, 758	5345-475-25	4.7 μF +50%–10% 25V
C753, 754	5345-106-25	10 μF +50%–10% 25V
	INTEGRATED CIRCUIT	
IC703	5652-μPC4558C	μPC4558C –40dB LED Pre-Driver
	TRANSISTORS	
Q151, 152, 153, 154	5613-2320L(F)	2SC2320L(F) or (G) Mic. Amp.
Q401, 402	5613-1845(E)	2SC1845(E) or (F) Line Output Amp.
Q403, 404	5611-945(K)	2SA945(K) or (L) Line Output Amp.
Q751, 752, 753, 754	5613-2320(F)	2SC2320(F) or (G) Bias Calibration Amp.
Q755, 756, 757, 758	5613-2320(D)	2SC2320(D) –40dB LED Driver
	DIODES	
D751, 752, 753, 754	5631-1S2473	1S2473
D755	5635-RD13EB1	Zener, RD13EB1
	MISCELLANEOUS	
J1, 2	4451-00106	Jack, Microphones

POWER SUPPLY P.C. BOARD

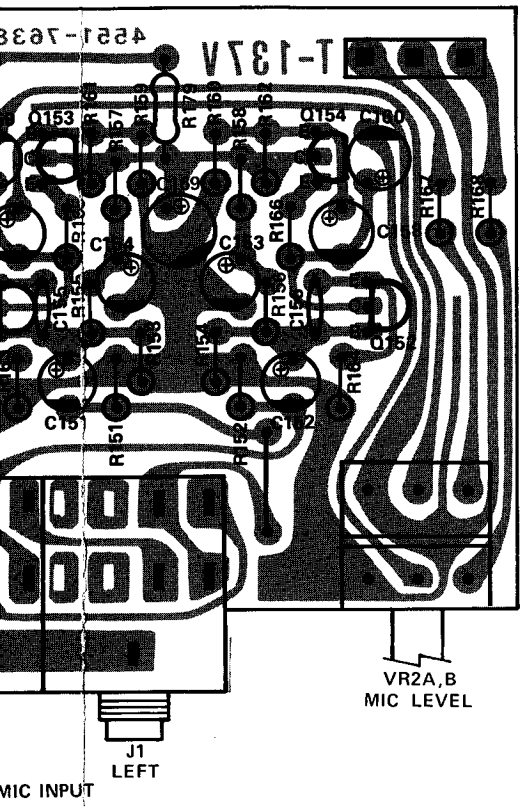


Ref. No.	Part No.	Description
	RESISTORS	
R802	5102-1004713	10 Ω ±2% 1/4W Fuse
R811	5102-2704713	27 Ω ±2% 1/4W Fuse
	CAPACITORS, ELECTROLYTIC	
C804	5345-106-50	10 μF +50%–10% 50V
C805, 806	5345-108F041	1000 μF +50%–10% 50V
C807, 811	5345-477E041	470 μF +50%–10% 35V
C808, 812	5345-477D041	470 μF +50%–10% 25V
C818, 819	5345-228-25	2200 μF +50%–10% 25V
	TRANSISTORS	
Q801	5613-790(Y)	2SC790(Y) Voltage Regulator
Q802	5611-965(Y)	2SA965(Y) Voltage Regulator
Q803	5616-2SK163(M	F.E.T., 2SK163(M) Current Regulator
Q804	5613-2320(F)	2SC2320(F) Voltage Regulator
	DIODES	
D801	5685-S1VB20	Bridge Silicon, S1VB20
D802, 803, 804, 805, 806	5632-1SR35-10	1SR35-100
D807	5635-RD5R1EB2	Zener, RD5R1EB2
D808	5635-RD24EB2	Zener, RD24EB2

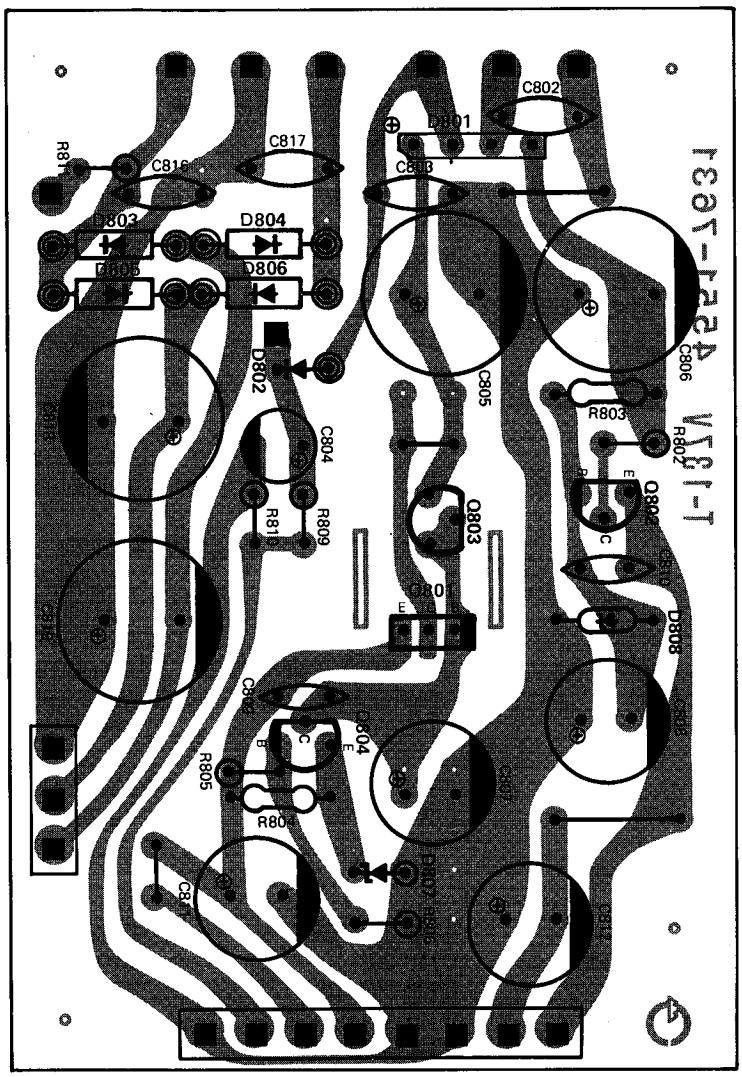
MIC. & LINE AMP. P.C. BOARD



Ref. No.	Part No.	Description
	RESISTORS	
VR2A, B	5113-5037182	Variable Resistor, 50 kΩ Mic. Level Control
VR3	5113-1037621	Variable Resistor, 10 kΩ Bias Fine Trim Control
VR4A, B	5113-5027F40	Variable Resistor, 5 kΩ Output Level Control
VR701, 702	5101-1037374	Variable Resistor, 10 kΩ
VR751, 752	5101-50171913	Variable Resistor, 500 Ω
	CAPACITORS, ELECTROLYTIC	
C151, 152, 159, 160	5345-106C0212	10 μF ±20% 16V
C153, 154	5345-105-50	1 μF +75%–10% 50V
C157, 158, 755, 756	5345-106-16	10 μF +50%–10% 16V
C169	5345-227D041	220 μF +50%–10% 25V
C401, 402	5345-475D0212	4.7 μF ±20% 25V
C403, 404	5345-476-25	47 μF +50%–10% 25V
C415	5345-107-25	100 μF +50%–10% 25V
C751, 752, 757, 758	5345-475-25	4.7 μF +50%–10% 25V
C753, 754	5345-106-25	10 μF +50%–10% 25V
	INTEGRATED CIRCUIT	
IC703	5652-μPC4558C	μPC4558C –40dB LED Pre-Driver
	TRANSISTORS	
Q151, 152, 153, 154	5613-2320L(F)	2SC2320L(F) or (G) Mic. Amp.
Q401, 402	5613-1845(E)	2SC1845(E) or (F) Line Output Amp.
Q403, 404	5611-945(K)	2SA945(K) or (L) Line Output Amp.
Q751, 752, 753, 754	5613-2320(F)	2SC2320(F) or (G) Bias Calibration Amp.
Q755, 756, 757, 758	5613-2320(D)	2SC2320(D) –40dB LED Driver
	DIODES	
D751, 752, 753, 754	5631-1S2473	1S2473
D755	5635-RD13EB1	Zener, RD13EB1
	MISCELLANEOUS	
J1, 2	4451-00106	Jack, Microphones



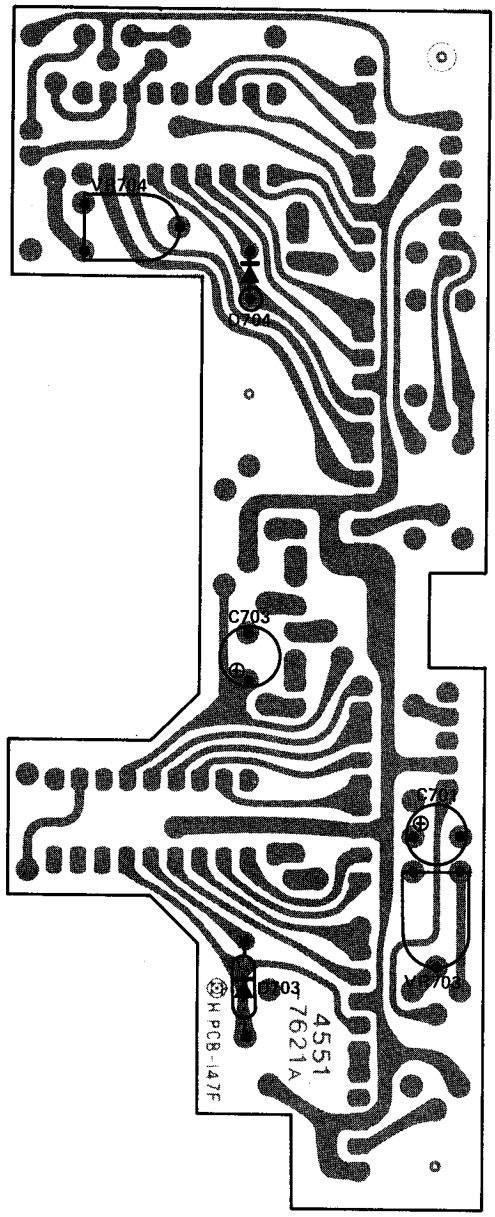
POWER SUPPLY P.C. BOARD



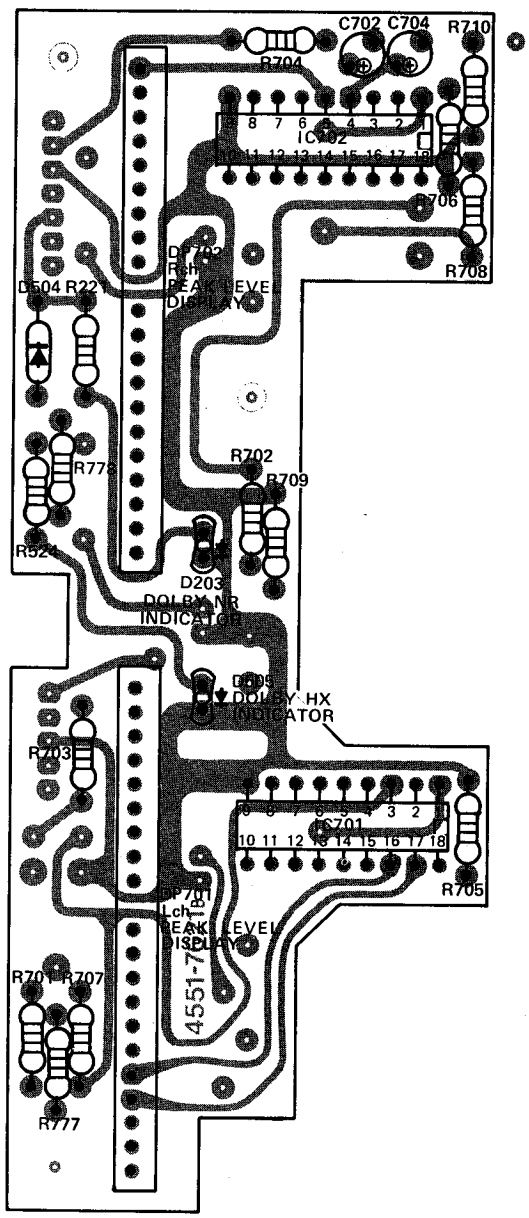
Ref. No.	Part No.	Description
	RESISTORS	
R802	5102-1004713	10 Ω ±2% 1/4W Fuse
R811	5102-2704713	27 Ω ±2% 1/4W Fuse
	CAPACITORS, ELECTROLYTIC	
C804	5345-106-50	10 μF +50%–10% 50V
C805, 806	5345-108F041	1000 μF +50%–10% 50V
C807, 811	5345-477E041	470 μF +50%–10% 35V
C808, 812	5345-477D041	470 μF +50%–10% 25V
C818, 819	5345-228-25	2200 μF +50%–10% 25V
	TRANSISTORS	
Q801	5613-790(Y)	2SC790(Y) Voltage Regulator
Q802	5611-965(Y)	2SA965(Y) Voltage Regulator
Q803	5616-2SK163(M	F.E.T., 2SK163(M) Current Regulator
Q804	5613-2320(F)	2SC2320(F) Voltage Regulator
	DIODES	
D801	5685-S1VB20	Bridge Silicon, S1VB20
D802, 803, 804, 805, 806	5632-1SR35-10	1SR35-100
D807	5635-RD5R1EB2	Zener, RD5R1EB2
D808	5635-RD24EB2	Zener, RD24EB2

PEAK LEVEL DISPLAY P.C. BOARD

SIDE A



SIDE B

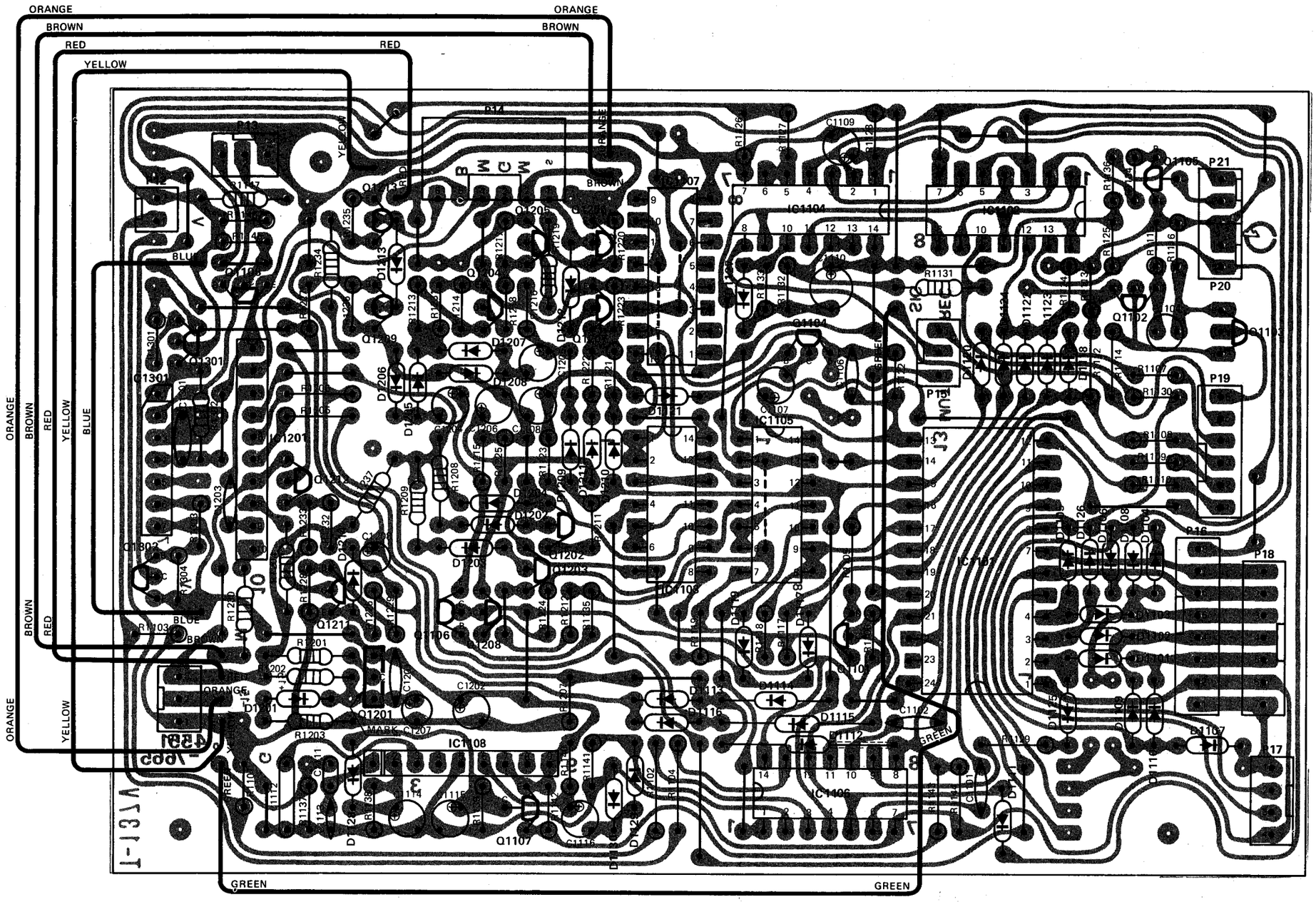


Ref. No.	Part No.	Description
	RESISTORS	
VR703, 704	5101-50171913	Variable Resistor, 500 Ω
	CAPACITORS, ELECTROLYTIC	
C701, 702	5345-106-16	10 μF +50%—10% 16V
C703, 704	5345-226C0212	22 μF ±20% 16V
	INTEGRATED CIRCUITS	
IC701, 702	5652-BA682A	BA682A Peak Level Display Driver
	DIODES	
D203	5637-TLG226	L.E.D., TLG226 Dolby NR Indicator
D504	5632-1SR35-10	1SR35-100
D505	5637-TLG226	L.E.D., TLG226 Dolby HX Indicator
D703, 704	5631-1S2473	1S2473
DP701, 702	5623-GL112F9	LED Display, GL112F9 Peak Level

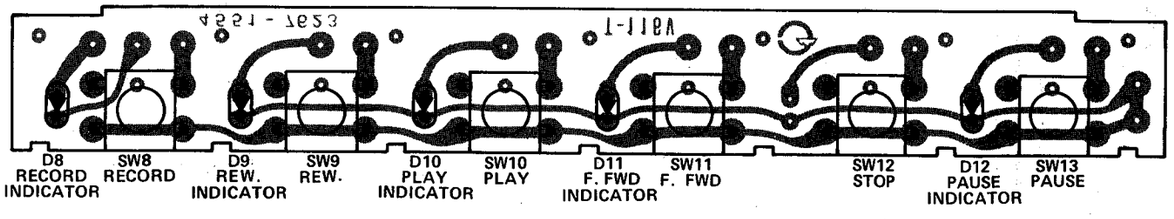
CONTROL P.C. BOARD

Ref. No.	Part No.	Description
	RESISTORS	
R1201	5102-2205114	22 Ω ±5% 1/2W Fuse
R1204, 1208, 1209, 1230	5102-1004713	10 Ω ±2% 1/4W Fuse
	CAPACITORS, ELECTROLYTIC	
C1104	5342-226C0951	22 μF ±20% 16V
C1107	5345-684F0212	0.68 μF ±20% 50V
C1108, 1115, 1204, 1205, 1206, 1207, 1208	5345-106-16	10 μF +50%–10% 16V
C1109, 1116	5345-105-50	1 μF +75%–10% 50V
C1110	5345-476C0212	47 μF ±20% 16V
C1114	5345-224F0212	0.22 μF ±20% 50V
C1202	5345-107-16	100 μF +50%–10% 16V
	INTEGRATED CIRCUITS	
IC1101	5654-TC9121P	TC9121P Tape Deck Control
IC1102, 1103	5654-μPD4001C	μPD4001C Auto Program Search
IC1104, 1105	5654-μPD4011C	μPD4011C Auto Program Search, Inverter/Osc. Time Control
IC1106	5654-μPD4023C	μPD4023C Counter Memory
IC1107	5654-μPD4017C	μPD4017C Decade Counter Divider
IC1108	5654-BA335	BA335 Signal Comparator
IC1201	5653-BA6109	BA6109 Reel Motor Control
IC1301	5654-AN6250	AN6250 Auto Stop Driver
	TRANSISTORS	
Q1101	5613-2603(F)	2SC2603(F)
Q1102, 1103	5613-2603(F)	2SC2603(F) Record Indicator Driver
Q1104	5613-2603(F)	2SC2603(F) Osc. Time Control
Q1105	5613-2603(F)	2SC2603(F) Auto Program Search Indicator Driver
Q1106	5613-2603(F)	2SC2603(F) Auto Program Search Solenoid Driver
Q1107	5611-1115(F)	2SA1115(F) Auto Program Search Switching
Q1108	5613-2603(F)	2SC2603(F) Rotation Sensor Amp.
Q1201	5613-1449(K)	2SC1449(K) Voltage Regulator
Q1202, 1203	5613-2603(F)	2SC2603(F) Motor Turning Control
Q1204, 1208	5613-2603(F)	2SC2603(F)
Q1205	5611-1115(F)	2SA1115(F)
Q1206	5614-863(E)	2SD863(E) } Play Starting Solenoid Driver
Q1207	5614-355(D)	2SD355(D) or (E)
Q1209	5614-355(D)	2SD355(D) or (E)
Q1211	5613-2603(F)	2SC2603(F)
Q1212	5611-1115(F)	2SA1115(F) } Brake Solenoid Driver
Q1213	5614-863(E)	2SD863(E)
Q1301	5613-2603(F)	2SC2603(F) Auto Stop Switching
Q1302	5611-1115(F)	2SA1115(F) Auto Stop Driver
	DIODES	
D1101 ~ 1130, 1205 ~ 1211, 1214	5631-1S2473	1S2473
D1201	5635-EQA0111R	Zener, EQA0111R
D1202	5635-RD4A(M)	Zener, RD4A(M)
D1203	5635-EQA0110R	Zener, EQA0110R
D1204	5635-EQA0115R	Zener, EQA0115R
D1212, 1213	5632-1SR35-10	1SR35-100

CONTROL P.C. BOARD

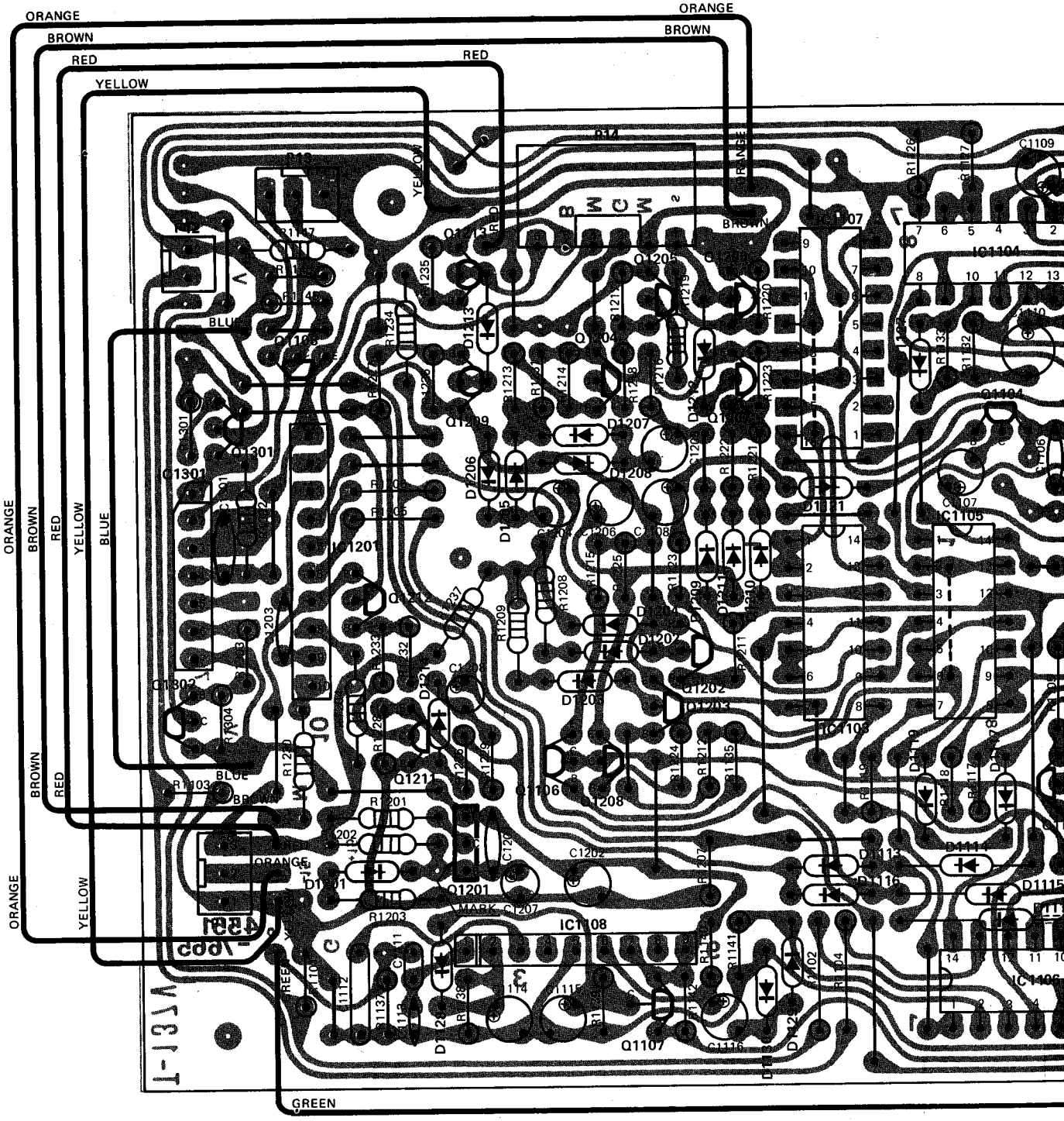


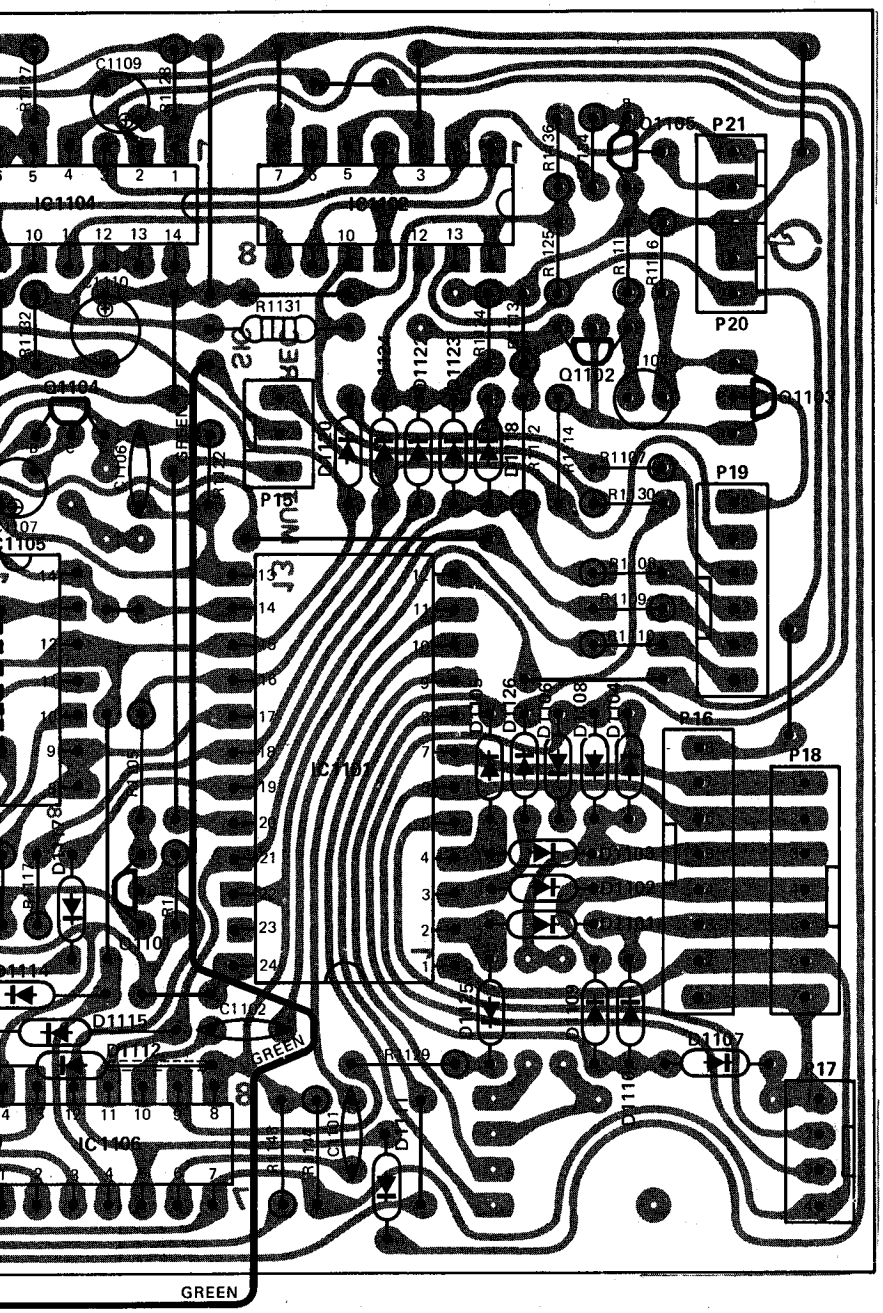
CASSETTE LED P.C. BOARD

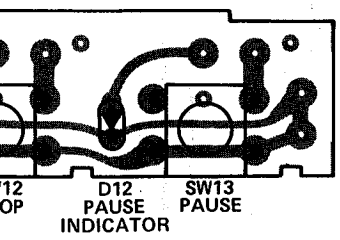


Ref. No.	Part No.	Description
SW8, 9, 10, 11, 12, 13	4431-01017193	Push Switch, Record, Rew., Play, F. FWD, Stop, Pause
D8	5637-TLR226	Light Emitting Diode, TLR226 Record Indicator
D9, 10, 11	5637-TLG226	Light Emitting Diode, TLG226 Rew., Play and F. FWD Indicators
D12	5637-TLY226	Light Emitting Diode, TLY226 Pause Indicator

CONTROL P.C. BOARD

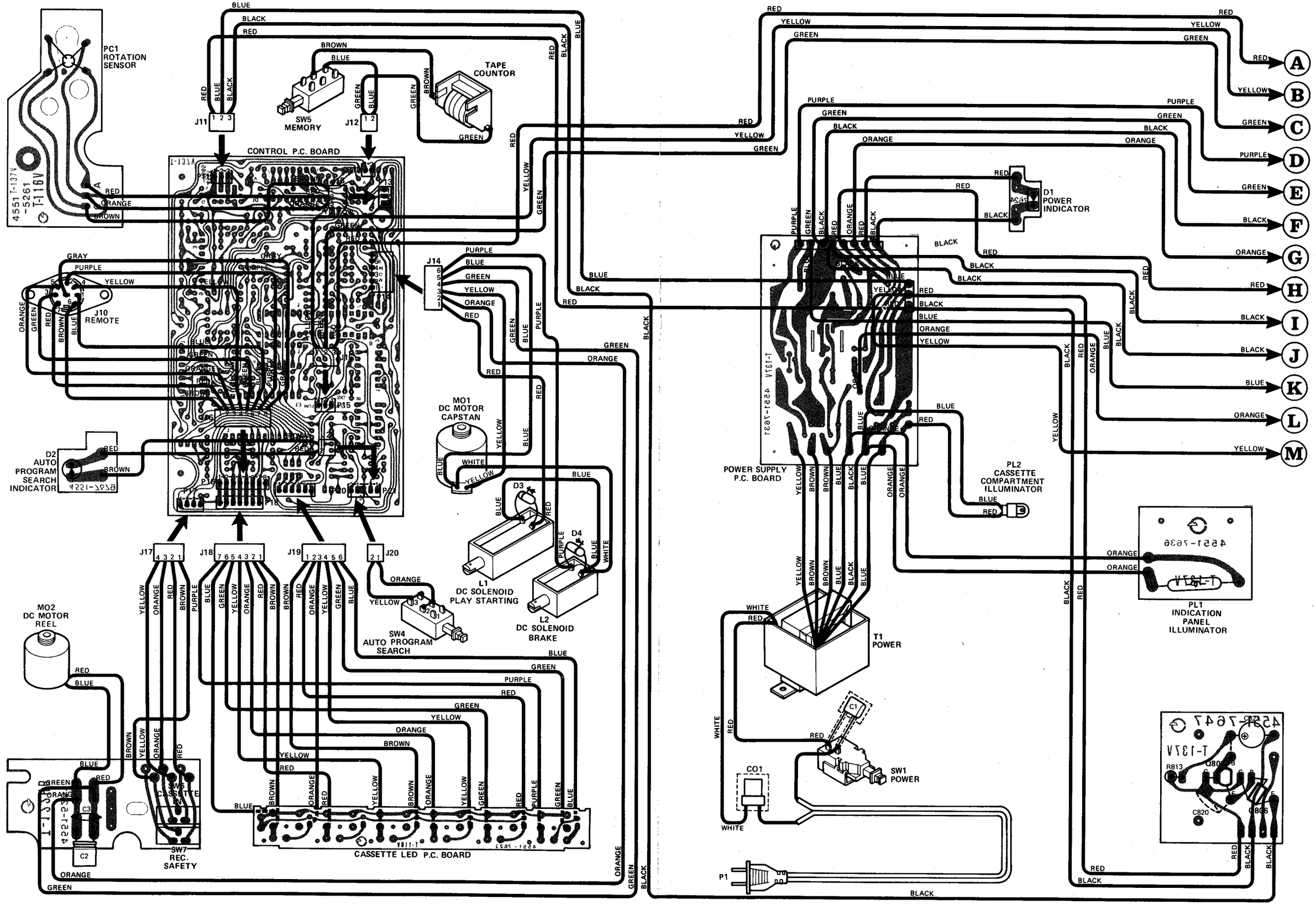




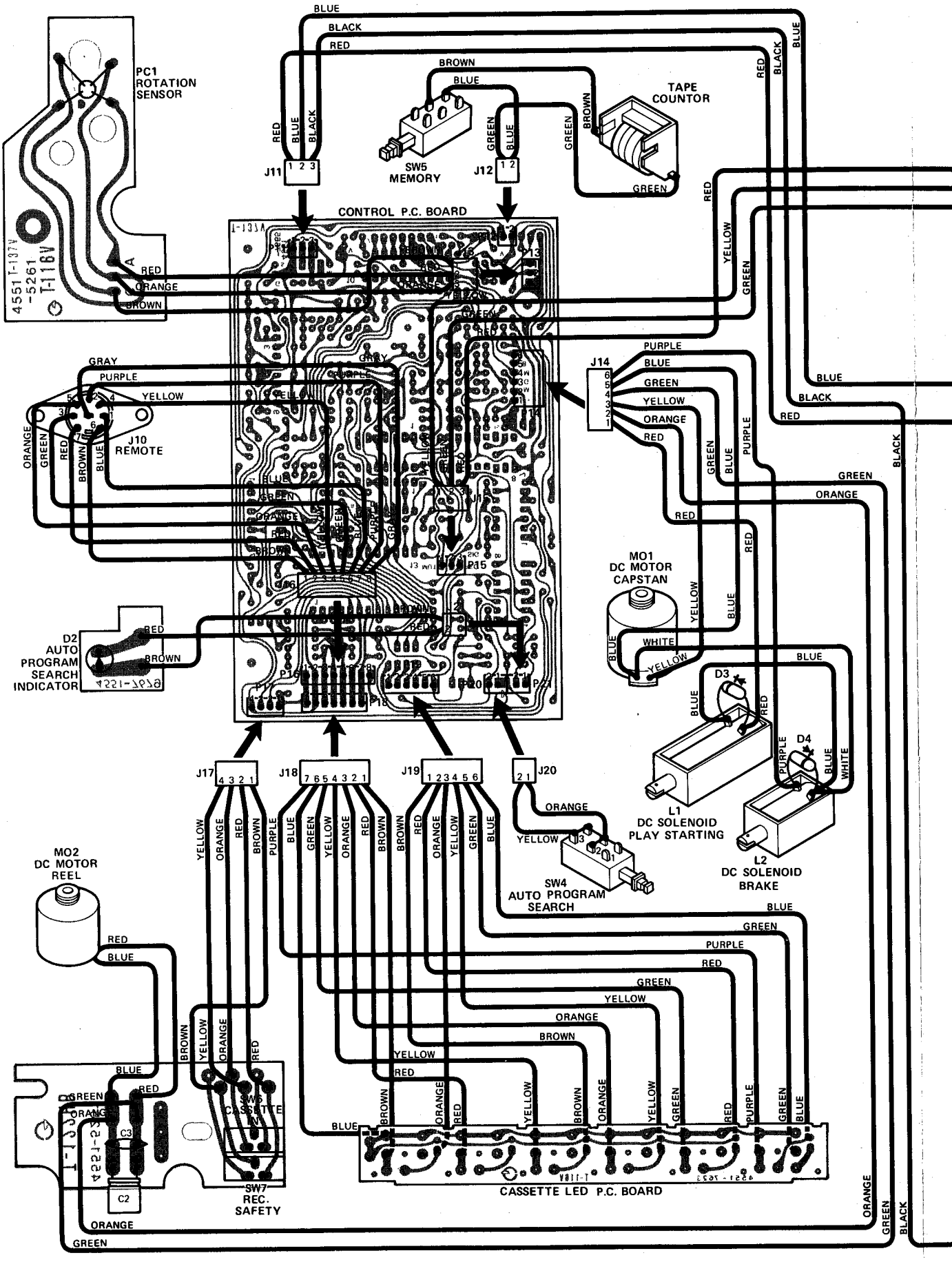


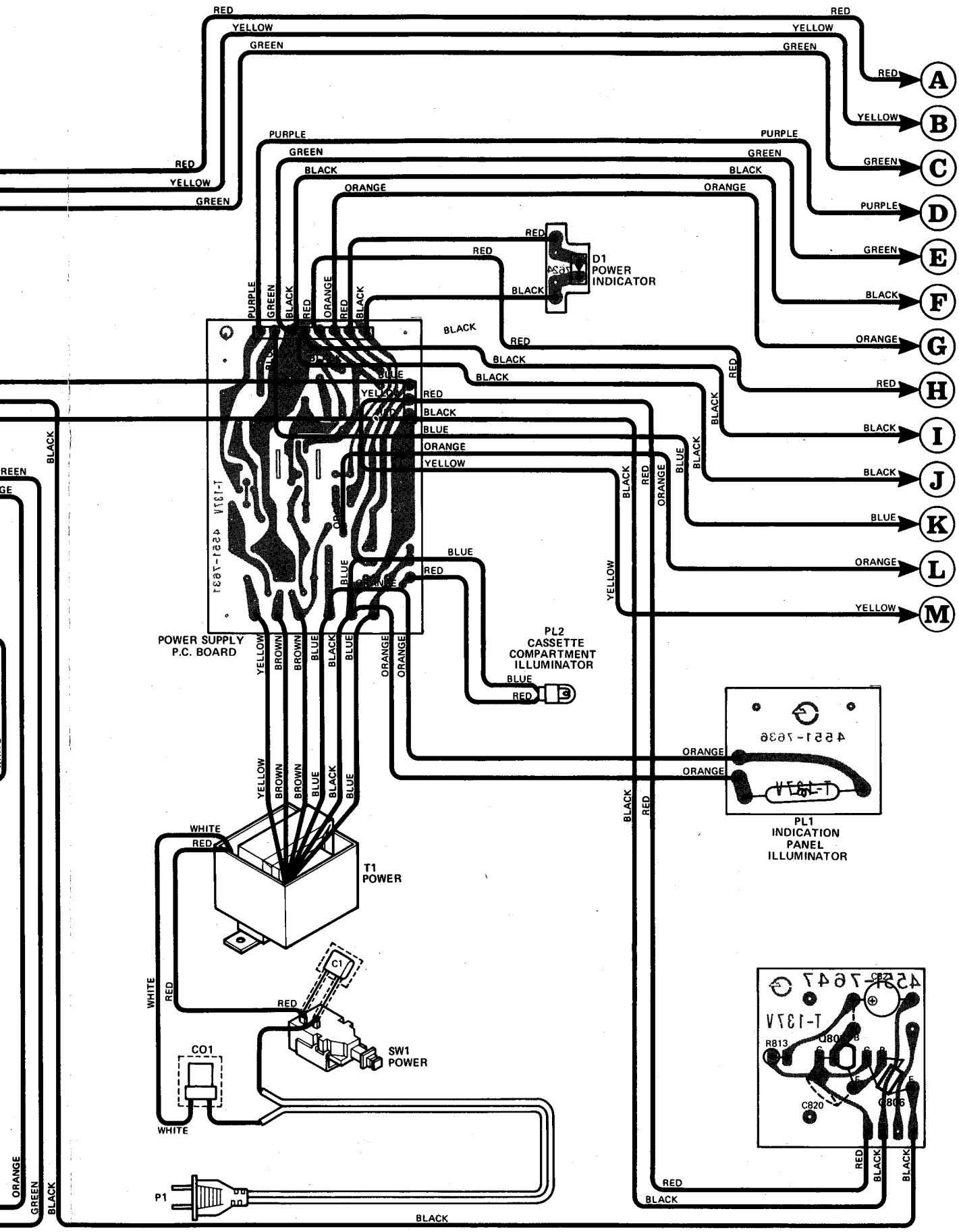
Ref. No.	Part No.	Description
SW8, 9, 10, 11, 12, 13	4431-01017193	Push Switch, Record, Rew., Play, F. FWD, Stop, Pause
D8	5637-TLR226	Light Emitting Diode, TLR226 Record Indicator
D9, 10, 11	5637-TLG226	Light Emitting Diode, TLG226 Rew., Play and F. FWD Indicators
D12	5637-TLY226	Light Emitting Diode, TLY226 Pause Indicator

WIRING DIAGRAM

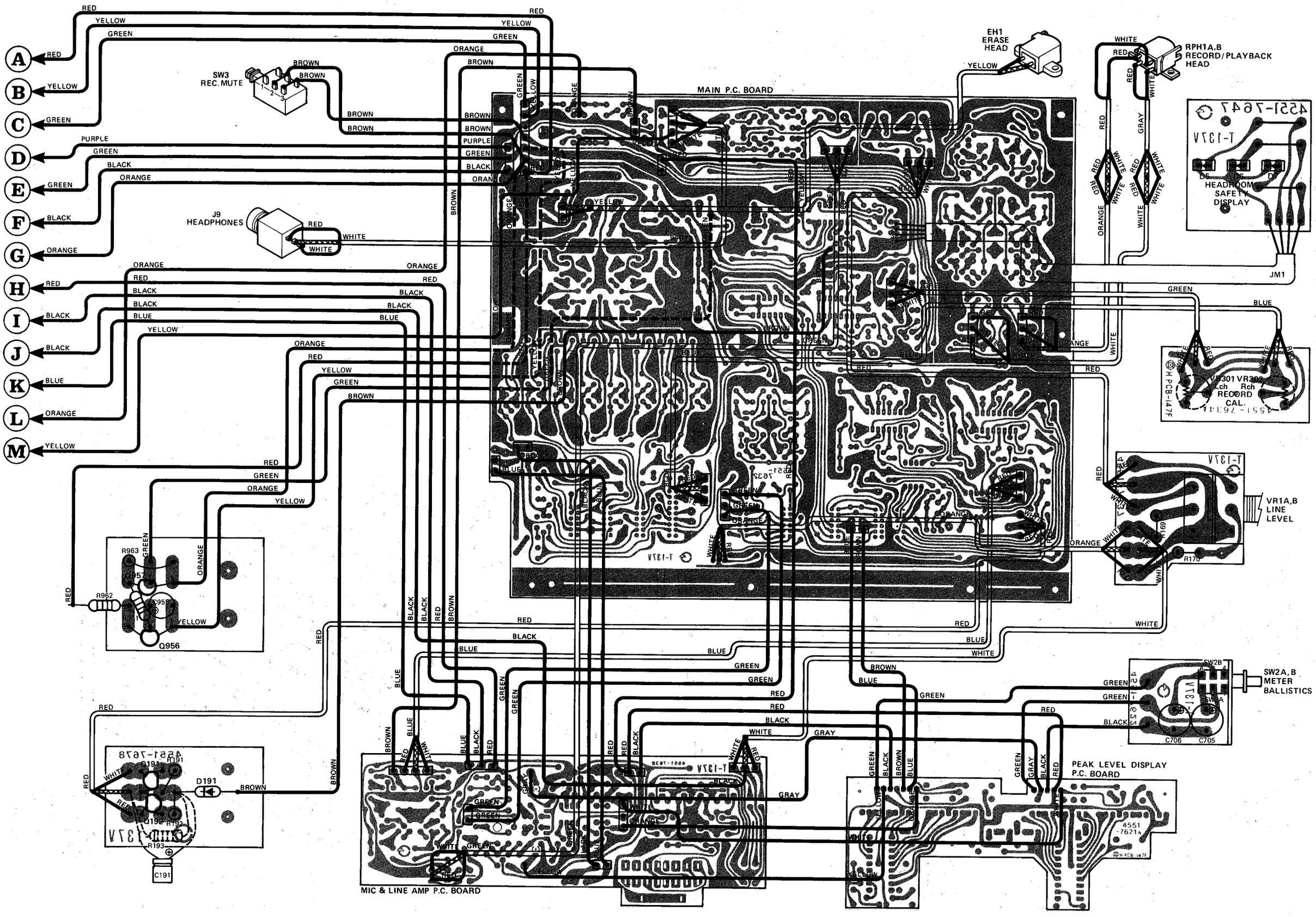


WIRING DIAGRAM

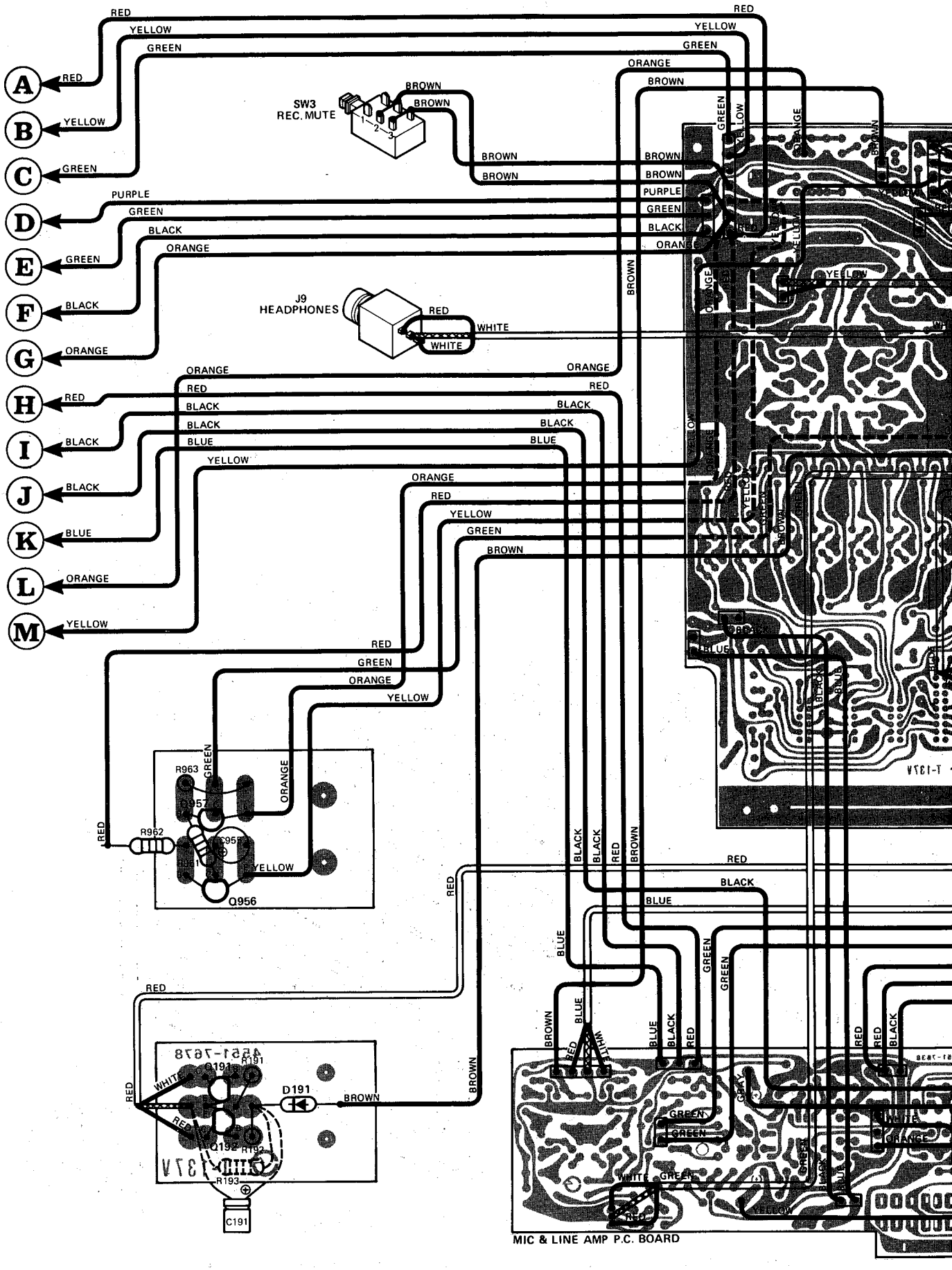


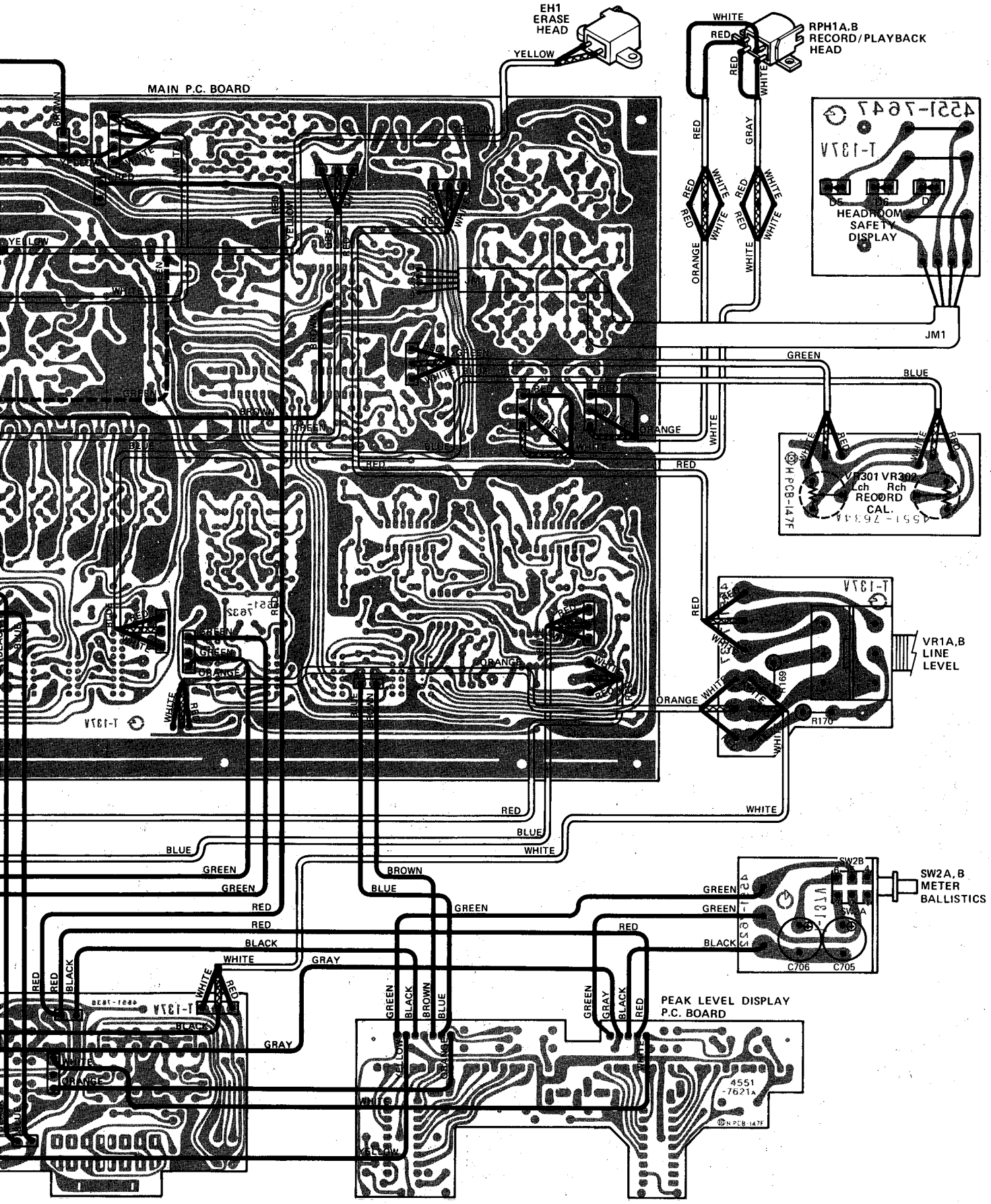

RED
YELLOW
GREEN
PURPLE
BLACK
ORANGE
BROWN
BLUE
WHITE
A
B
C
D
E
F
G
H
I
J
K
L
M
D1
POWER
INDICATOR
POWER SUPPLY
P.C. BOARD
PL2
CASSETTE
COMPARTMENT
ILLUMINATOR
PL1
INDICATION
PANEL
ILLUMINATOR
T1
POWER
SW1
POWER
C1
CO1
P1
R813
C820
C822
C806

WIRING DIAGRAM

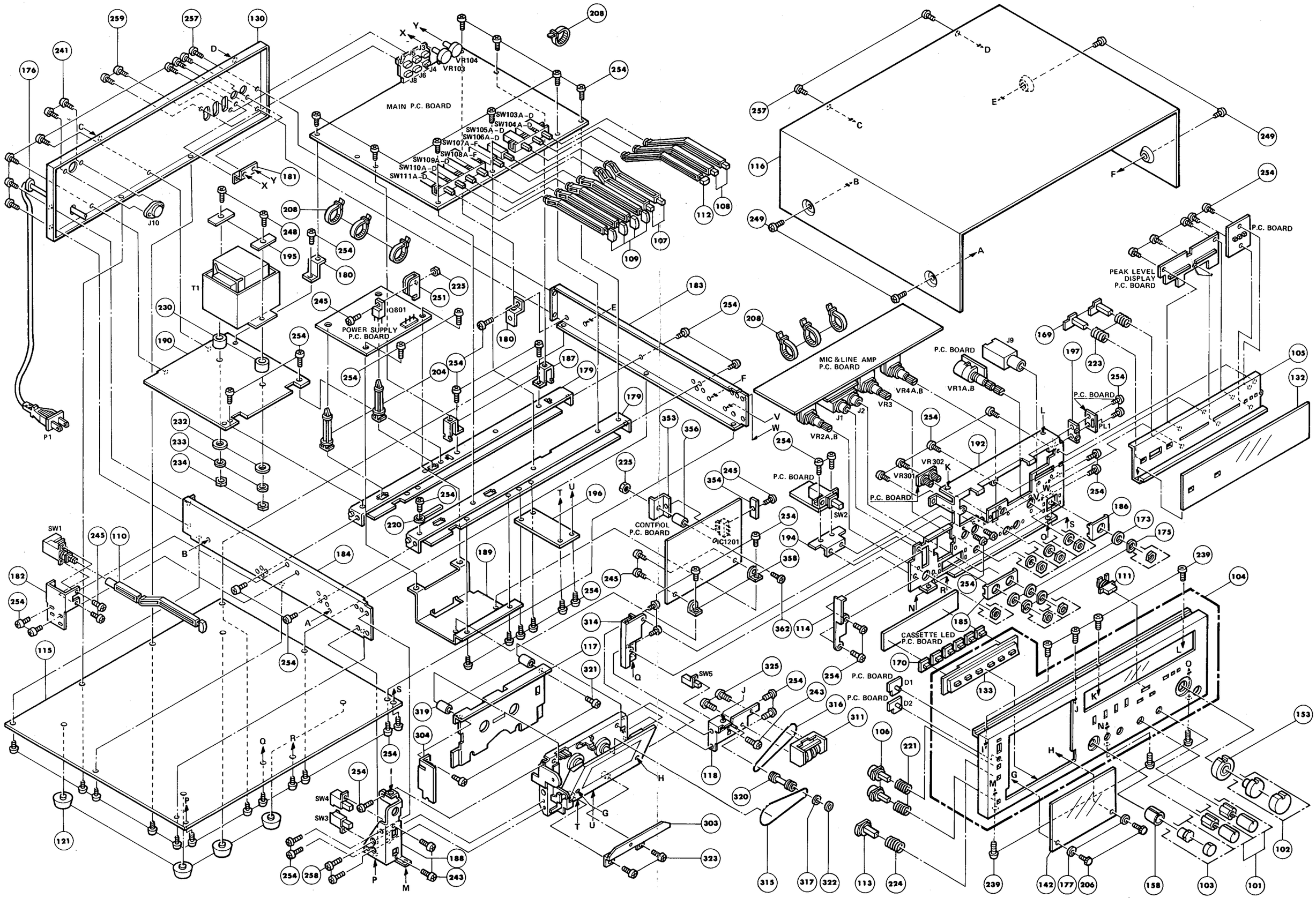


WIRING DIAGRAM

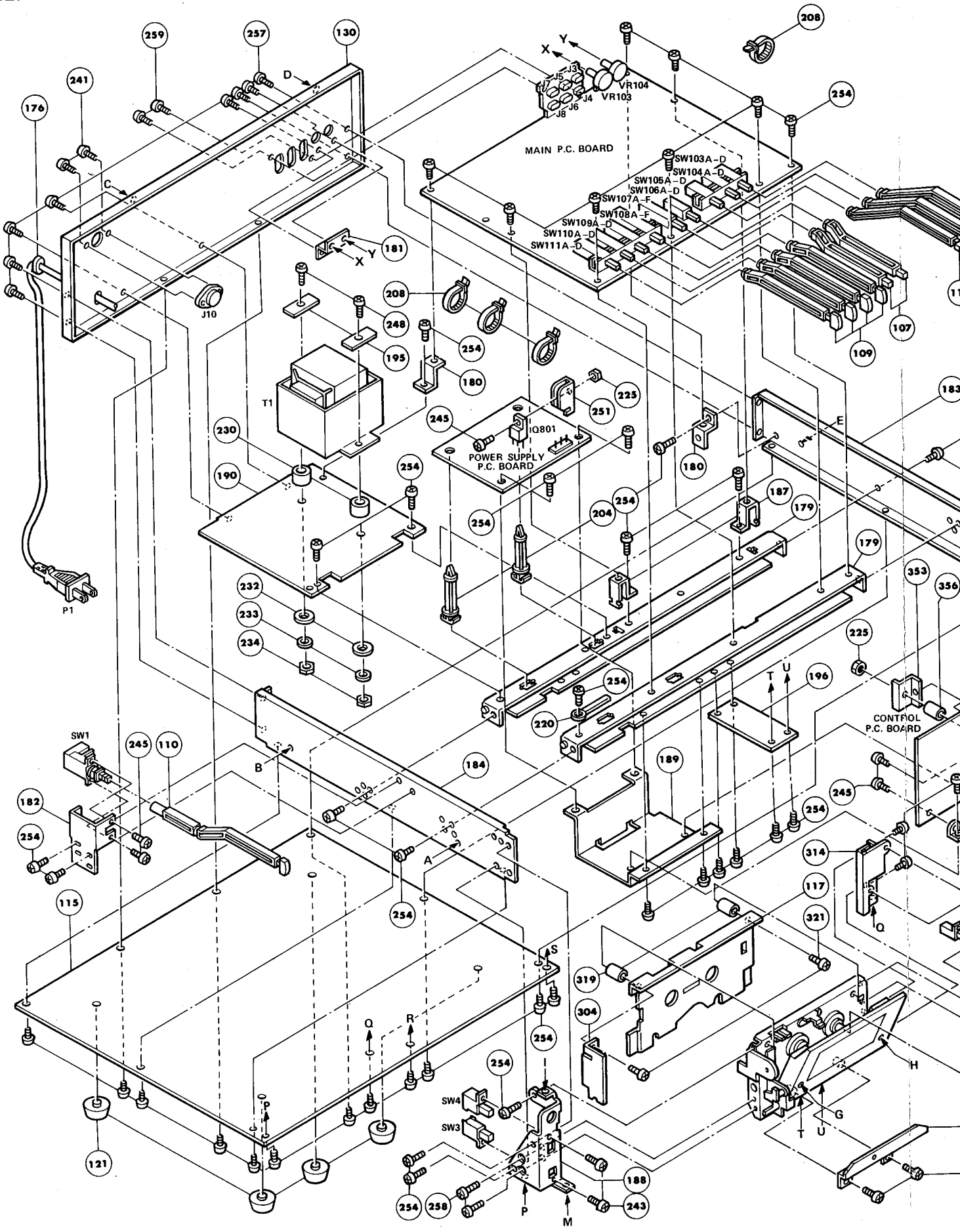


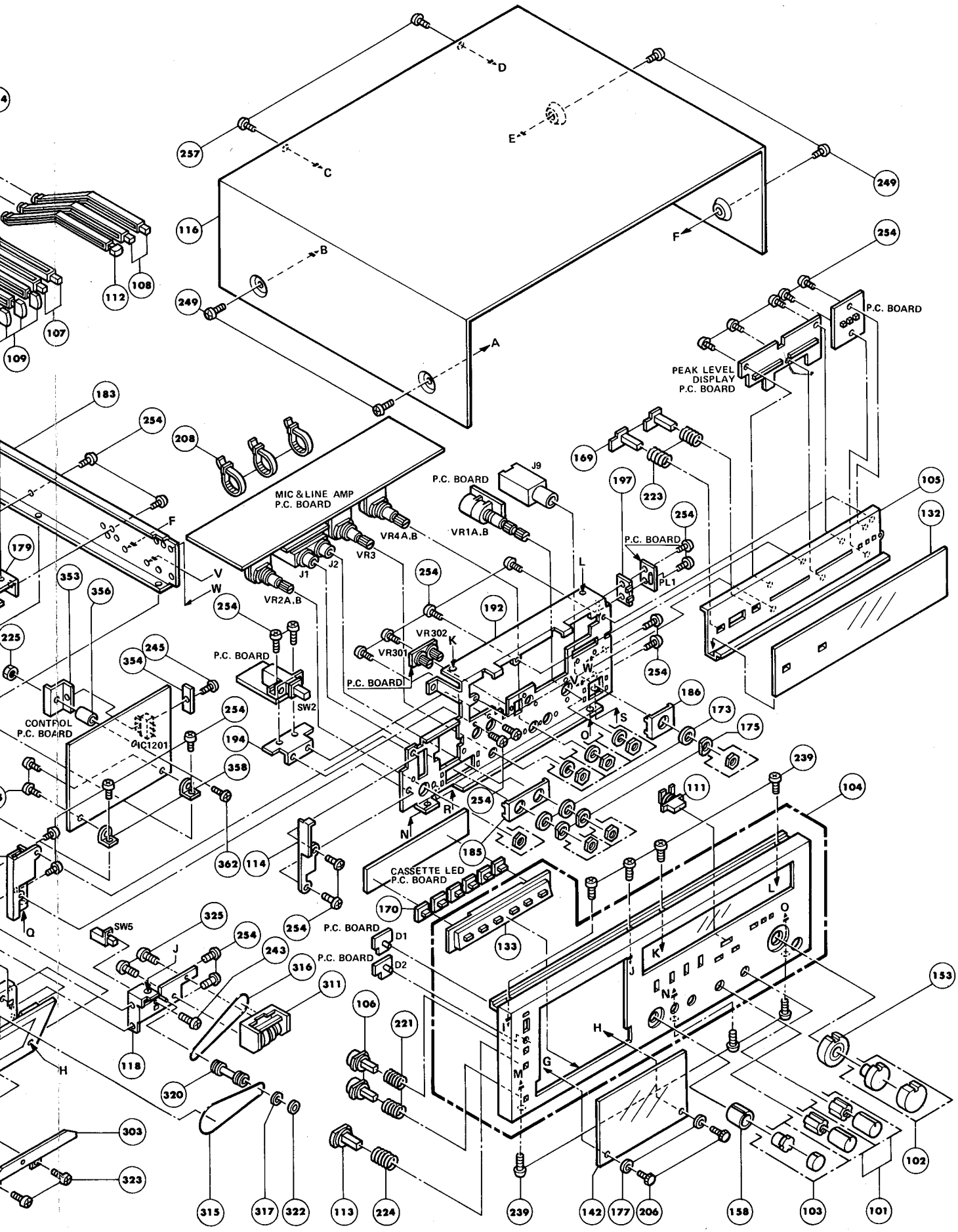

EH1
ERASE
HEAD
YELLOW
RPH1A,B
RECORD/PLAYBACK
HEAD
WHITE
RED
GRAY
MAIN P.C. BOARD
HEADROOM
SAFETY
DISPLAY
JM1
GREEN
BLUE
ORANGE
VR301 VR302
Lch Rch
RECORD
CAL.
VR1A,B
LINE
LEVEL
R170
BROWN
BLACK
SW2A,B
METER
BALLISTICS
SW2B
SW2A
C706
C705
PEAK LEVEL DISPLAY
P.C. BOARD

GENERAL UNIT EXPLODED VIEW

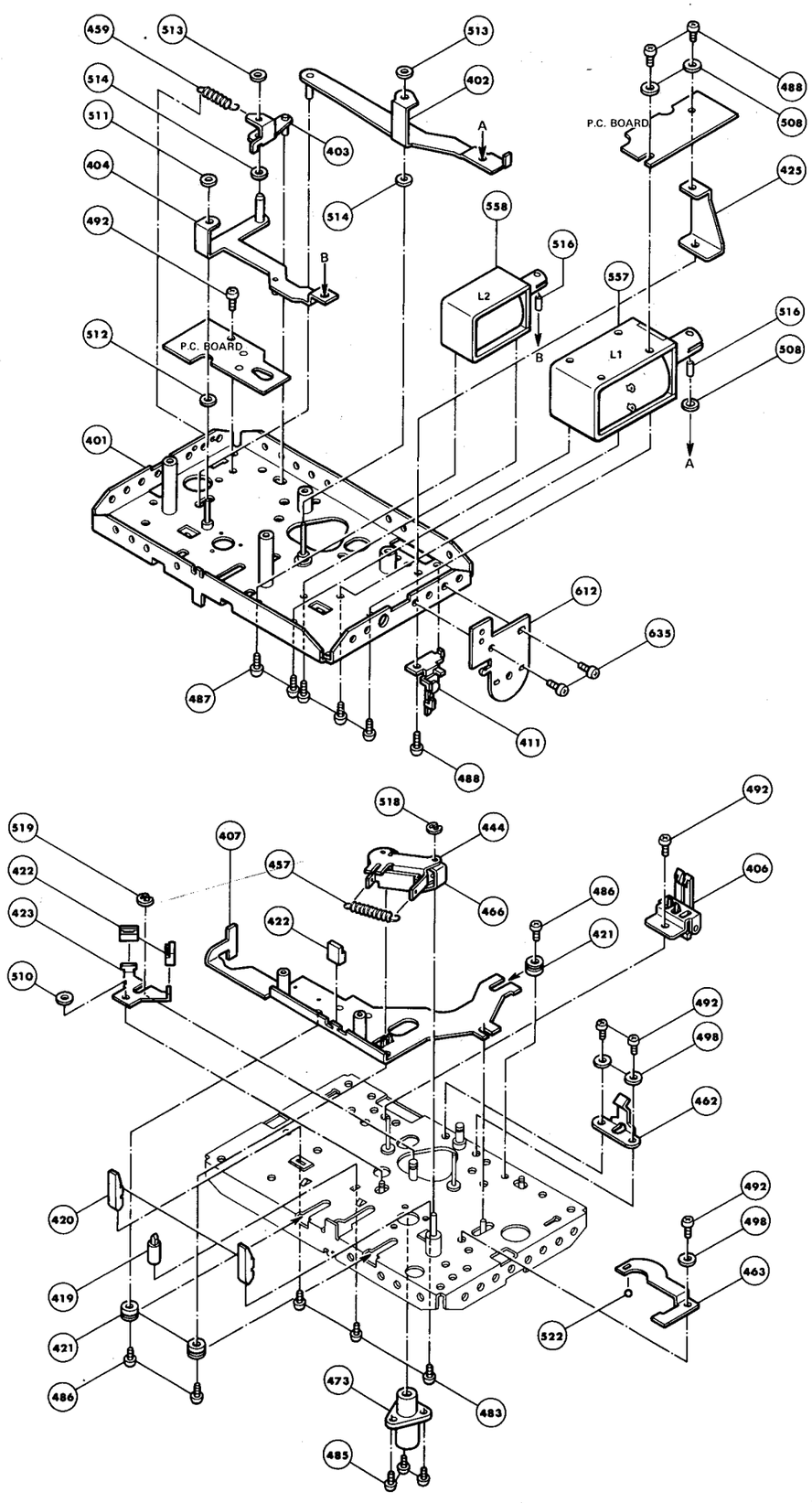


GENERAL UNIT EXPLODED VIEW

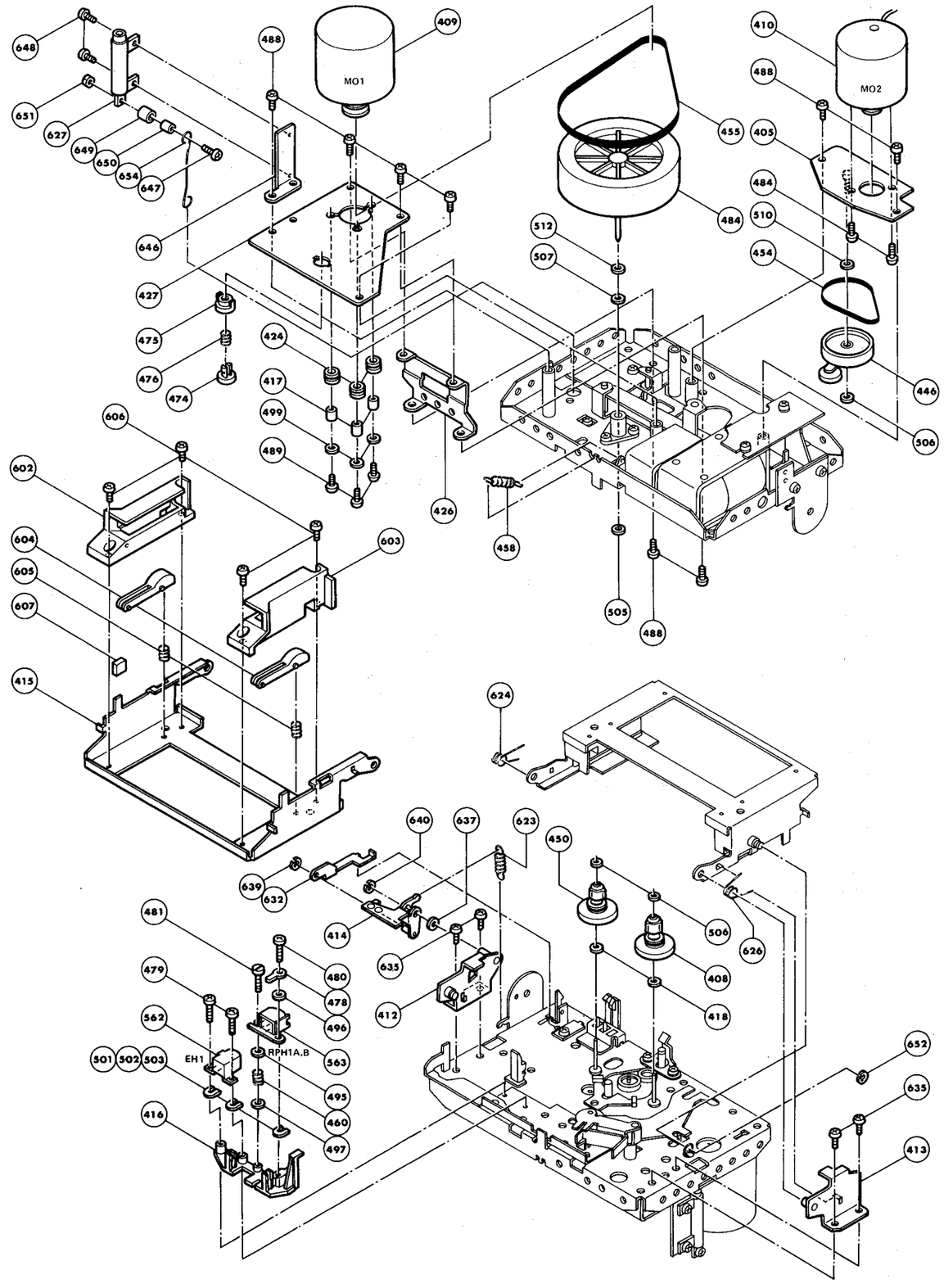



P.C. BOARD
PEAK LEVEL DISPLAY P.C. BOARD
MIC & LINE AMP P.C. BOARD
P.C. BOARD
VR4A,B
VR1A,B
VR3
VR2A,B
J1
J2
J9
P.C. BOARD
PL1
VR302
VR301
P.C. BOARD
P.C. BOARD
SW2
CONTROL P.C. BOARD
IC1201
CASSETTE LED P.C. BOARD
P.C. BOARD
D1
P.C. BOARD
D2
SW5

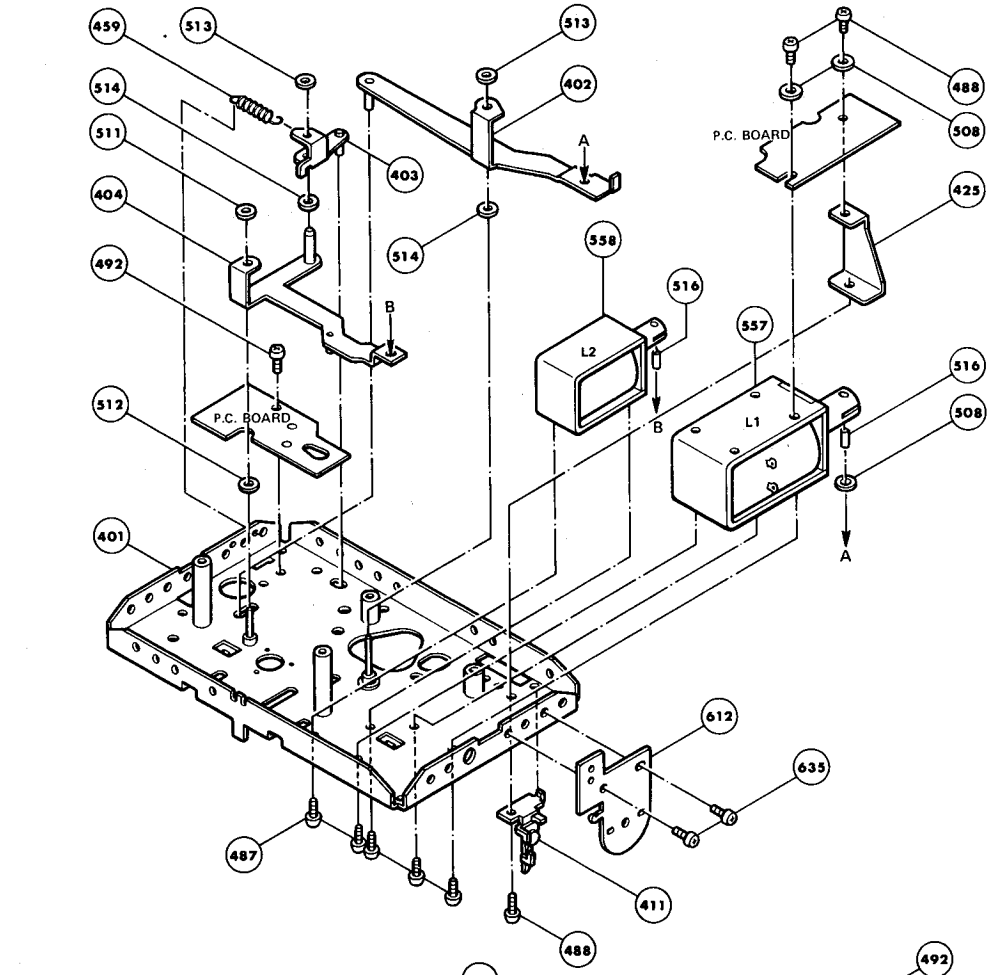
CASSETTE TAPE RECORDER EXPLODED VIEW

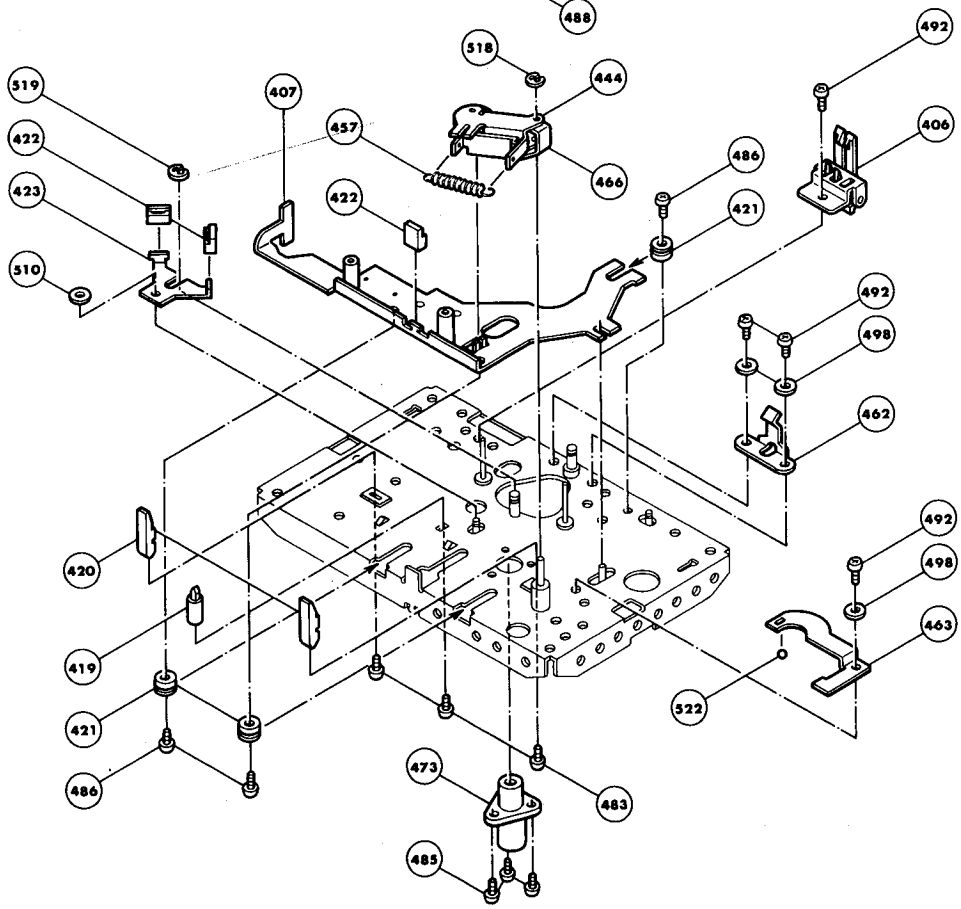


CASSETTE TAPE RECORDER EXPLODED VIEW

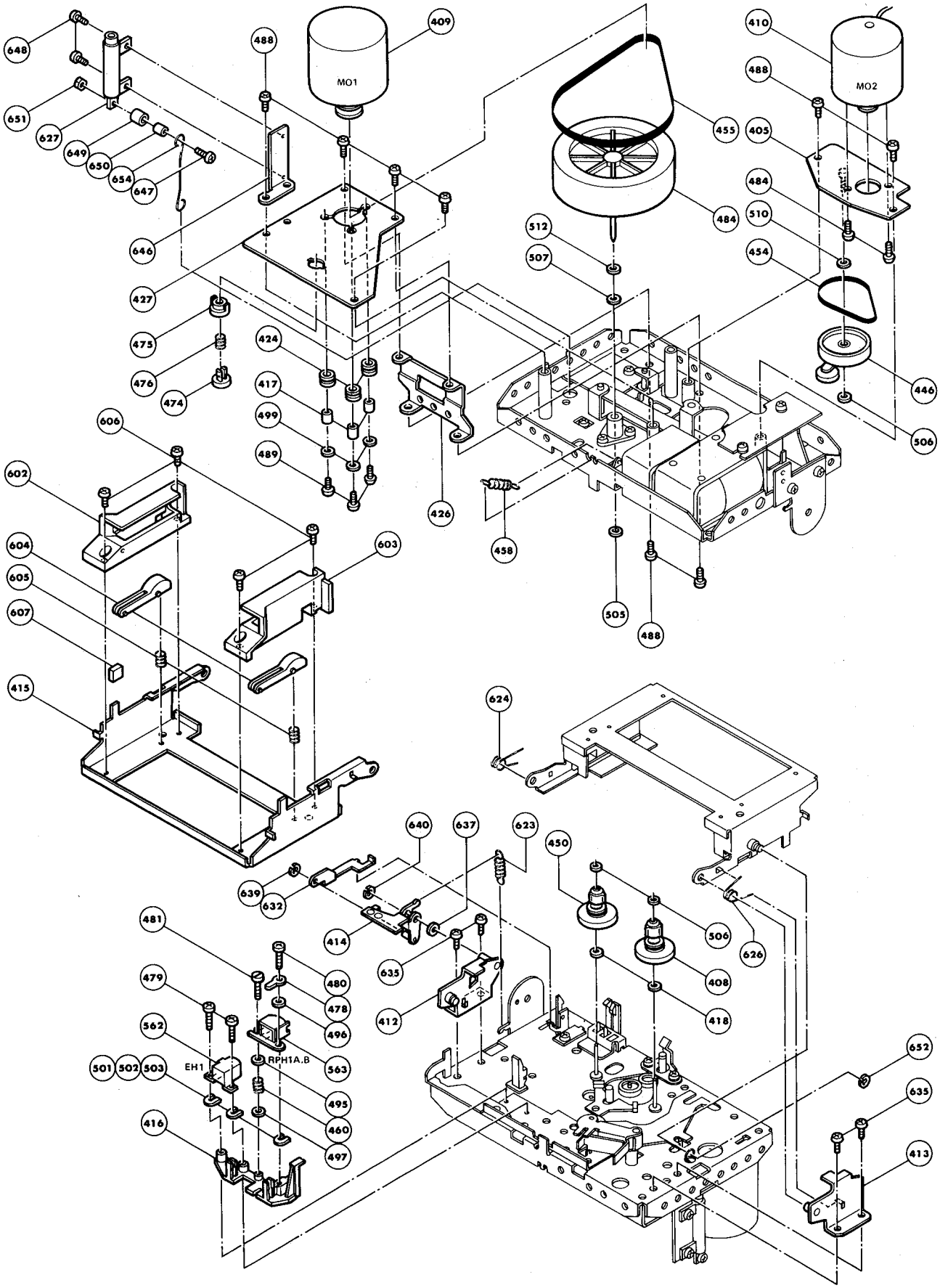


CASSETTE TAPE RECORDER EXPLODED VIEW





CASSETTE TAPE RECORDER EXPLODED VIEW



CHASSIS PARTS LIST

Ref. No.	Part No.	Description
		GENERAL UNIT
101	A634-HK300-A	Knob Assembly, Output Level, Bias Fine Trim
102	A634-HK300-B	Knob Assembly, L ch. Line Level
103	A634-HK300-C	Knob Assembly, L ch. Microphone Level
104	A442-HK300	Front Panel Assembly
106	A662-HK300-A	Push Button Assembly, Rec. Mute, Auto Program Search
107	A662-HK300-B	Push Button Assembly, Rec. Cal. Tone, Bias Tone
108	A662-HK300-C	Push Button Assembly, MPX Filter, Dolby NR
109	A662-HK300-D	Push Button Assembly, LN, FeCr, CrO_2 Metal
110	A662-HK300-E	Push Button Assembly, Power
111	A662-HK300-F	Push Button Assembly, Meter Ballistics
112	A662-HK300-G	Push Button Assembly, Dolby HX
113	A662-HK300-H	Push Button Assembly, Eject
116	A414-HK300	Cabinet Top Assembly
121	1319-0139	Foot, Cabinet Bottom (x4)
130	1424-04001	Cabinet Back
132	1441-00201	Indication Panel, LED Display
142	1531-02301	Cassette Compartment Cover
153	1630-01301	Knob, R ch. Line Level
158	1634-02101	Knob, R ch. Microphone Level
169	1662-05801VN	Push Button, Memory, Tape Counter Reset
170	1662-05901VN	Push Button, Pause, Stop, F.FWD, Play, Rew., Record
311	3131-455006	Tape Counter
315	2642-01445	Belt, Reel Spindle
316	2642-01448	Belt, Tape Counter
		CASSETTE TAPE RECORDER
406	B219-MR061HFE	Switch Levers Assembly, Rec. Safety & Cassette In
408	B661-MR061HFA	Take-Up Reel Spindle Assembly
409 (MO1)	D311-MR061HFA	DC Motor Assembly (w/Pulley), Capstan
410 (MO2)	D311-MR061HFB	DC Motor Assembly (w/Pulley), Reel
444	2614-5030	Pinch Roller
446	2662-5019	Clutch, Play/F. FWD/Rew.
448	2617-5124	Flywheel
450	2661-415032	Supply Reel Spindle
454	2642-02415	Belt, Clutch
455	2642-02411	Belt, Flywheel
557 (L1)	4333-40215	DC Solenoid, Play Starting
558 (L2)	4333-40414	DC Solenoid, Brake
562 (EH1)	5873-1217	Erase Head
563 (RPH1A, B)	5874-1320	Record/Playback Head
627	2692-3	Damper, Eject
		ELECTRICAL
T1	5584-701314	Power Transformer
P1	4161-0487	AC Line Cord
SW1	4431-01017358	Push Switch, Power
SW2	4431-01027394	Push Switch, Meter Ballistics
SW3, 4	4431-01027195	Push Switch, Rec. Mute, Auto Program Search
SW5	4431-01027169	Push Switch, Memory
SW6, 7	4463-48	Spring Switch, Cassette In, Rec. Safety
VR1A, B	5113-5037182	Variable Resistor, 50 kΩ Line Level Control
VR301, 302	5101-2230177	Variable Resistor, 22 kΩ Record Calibration Control
C2	5342-226C0951	Capacitor, 22 μF ±20% 16V Electrolytic
C191	5345-107D0211	Capacitor, 100 μF ±20% 25V Electrolytic
C705, 706	5345-226C0212	Capacitor, 22 μF ±20% 16V Electrolytic
C821	5345-107D041	Capacitor, 100 μF +50%–10% 25V Electrolytic
C955	5345-106E0212	Capacitor, 10 μF ±20% 35V Electrolytic

CHASSIS PARTS LIST

Ref. No.	Part No.	Description
		ELECTRICAL (continued)
Q191, 192	5613-2603(F)	Transistor, 2SC2603(F)
Q806	5614-415(Q)	Transistor, 2SD415(Q) or (R)
Q807, 956	5613-2320(F)	Transistor, 2SC2320(F)
Q957	5612-647(C)	Transistor, 2SB647(C)
D1	5637-GL9PR20	Light Emitting Diode, GL9PR20 Power Indicator
D2	5637-TLG206	Light Emitting Diode, TLG206 Auto Program Search Indicator
D3, 4	5632-1SR35-10	Diode, 1SR35-100
D5	5637-GL9NG2	Light Emitting Diode, GL9NG2 } Headroom Safety Display
D6	5637-GL9HY2	Light Emitting Diode, GL9HY2 } Headroom Safety Display
D7	5637-GL9PR20	Light Emitting Diode, GL9PR20 } Headroom Safety Display
D191	5631-1S2473	Diode, 1S2473
PC1	5624-5141E(A)	Photo-Interrupter, Rotation Sensor
PL1	5731-1507245	Lamp, 15V 100mA Indication Panel Illuminator
PL2	5731-1404123	Lamp, 14V 50mA Cassette Compartment Illuminator
J9	4451-00108	Jack, Headphones
J10	4474-140	DIN Jack, Remote
	4161-7185	Plug with Cord, RCA

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CHASSIS PARTS LIST

Ref. No.	Part No.	Description
		GENERAL UNIT
101	A634-HK300-A	Knob Assembly, Output Level, Bias Fine Trim
102	A634-HK300-B	Knob Assembly, L ch. Line Level
103	A634-HK300-C	Knob Assembly, L ch. Microphone Level
104	A442-HK300	Front Panel Assembly
106	A662-HK300-A	Push Button Assembly, Rec. Mute, Auto Program Search
107	A662-HK300-B	Push Button Assembly, Rec. Cal. Tone, Bias Tone
108	A662-HK300-C	Push Button Assembly, MPX Filter, Dolby NR
109	A662-HK300-D	Push Button Assembly, LN, FeCr, CrO_2 Metal
110	A662-HK300-E	Push Button Assembly, Power
111	A662-HK300-F	Push Button Assembly, Meter Ballistics
112	A662-HK300-G	Push Button Assembly, Dolby HX
113	A662-HK300-H	Push Button Assembly, Eject
116	A414-HK300	Cabinet Top Assembly
121	1319-0139	Foot, Cabinet Bottom (x4)
130	1424-04001	Cabinet Back
132	1441-00201	Indication Panel, LED Display
142	1531-02301	Cassette Compartment Cover
153	1630-01301	Knob, R ch. Line Level
158	1634-02101	Knob, R ch. Microphone Level
169	1662-05801VN	Push Button, Memory, Tape Counter Reset
170	1662-05901VN	Push Button, Pause, Stop, F.FWD, Play, Rew., Record
311	3131-455006	Tape Counter
315	2642-01445	Belt, Reel Spindle
316	2642-01448	Belt, Tape Counter
		CASSETTE TAPE RECORDER
406	B219-MR061HFE	Switch Levers Assembly, Rec. Safety & Cassette In
408	B661-MR061HFA	Take-Up Reel Spindle Assembly
409 (MO1)	D311-MR061HFA	DC Motor Assembly (w/Pulley), Capstan
410 (MO2)	D311-MR061HFB	DC Motor Assembly (w/Pulley), Reel
444	2614-5030	Pinch Roller
446	2662-5019	Clutch, Play/F. FWD/Rew.
448	2617-5124	Flywheel
450	2661-415032	Supply Reel Spindle
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455	2642-02411	Belt, Flywheel
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